SEP 12 1947

Southern AERONAUTICS FLIGHT

Including MODERN AIRPORTS

AERO

September 1947
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THE CESSNA 195

(See story beginning page 9)

Start Flying Now!

Personal Aircraft Are Paying Their Way on Thousands of Ranches and Farms

Near as your Nearest Airport

The majority of personal planes are powered with reliable, economical Continental Red Seal engines. Chances are that the plane you buy will also be Continental-powered.

Day after day the light airplane is proving its utility in a wider and wider range of specialized fields. But nowhere else is it earning its keep, with such a margin to spare, as it is on ranch and farm. The recent rapid growth of Flying Farmer groups is proof of its development from a plaything to a useful tool, saving time and cutting costs on many routine farm tasks, leaving the farmer more to show for his work when it's done. Why not follow the lead of so many successful farmers? The Continental Motors dealer at your nearest airport will gladly show you how easily and inexpensively you can put this tool to work for YOU.

Continental Motors Corporation

AIRCRAFT ENGINE DIVISION — MUSKEGON, MICHIGAN

The Swift and Flying Horsepower

FAST, STURDY, DEPENDABLE—*The SWIFT,* built by Texas Engineering and Manufacturing Company at their big Grand Prairie, Texas, Plant. This able organization, headed by President Robert McCulloch, Executive Vice President H. L. Howard and General Supt. Al V. Graff with Swift Sales managed by Leonard Larson, is rapidly putting this well-deserving airplane into the forefront in the personal plane field. And they're starting them from the factory with Mobilgas and Mobiloil! In the photo above, Sales Manager Leonard Larson at right stands with Asst. Manager A. G. Falk, Dallas District, Magnolia Petroleum Company, beside a Mobilgas tender fueling Swifts for delivery throughout the country. At left a close-up of Larson starting out to call on TEMCO's far-flung dealer organization.

JACK MILLER (in circle at right) operates the SAM HOUSTON AIRPORT at HOUSTON, TEXAS, and has built it into one of the most popular and efficiently operated airports in the Southwest. Complete with administration building, restaurant facilities, hangar and maintenance service, it is a rapidly growing business in the busy Houston area. Fuel facilities include complete Mobilgas and Mobiloil service.

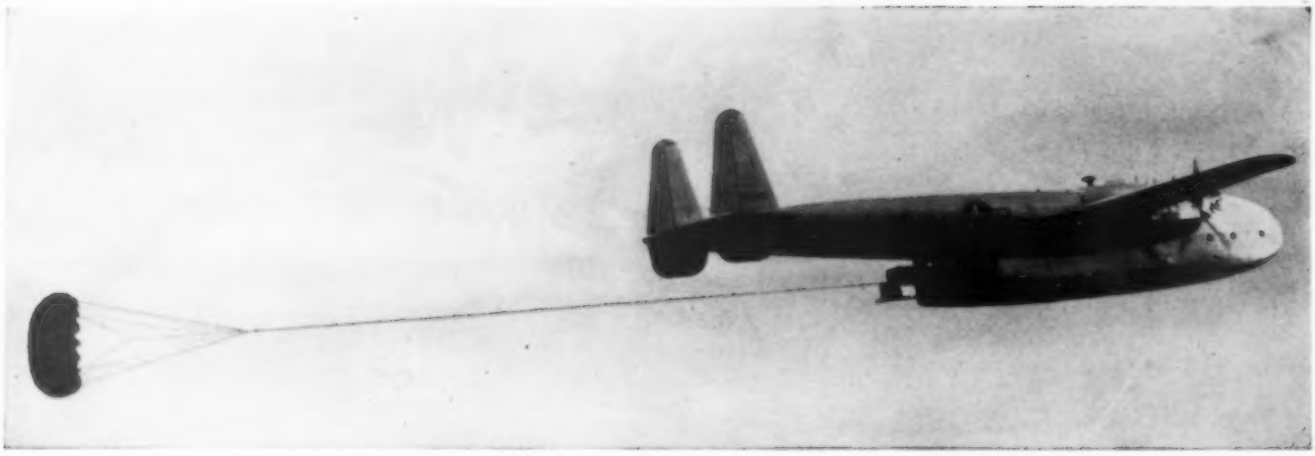
HENRY F. (HANK) SCHREIBER and FRED MITCHELL (in the picture at left), partners in the GALVESTON AVIATION SCHOOL at Galveston, Texas, Municipal Airport, look on as their Mobilgas tender fuels a visiting DC-3.

FORWARD WITH *Aviation*

Mobilgas AIRCRAFT **Mobiloil AERO**

MAGNOLIA PETROLEUM COMPANY

DALLAS 1, TEXAS



THERE'S BEEN A BIG DROP IN HOWITZERS

No telling what the Army Air Forces will do next with the Packet.

They've transported Airborne Troops and Air Transportable Infantry. They've towed gliders, carried weapons and cargo on maneuvers that are setting the pattern for the swift mobility of our peacetime army.

The Packet has carried jeeps, trucks, even helicopters.

Now, through the ingenious application of ribbon parachutes, a Packet can deliver a 75 mm. howitzer — by air — ready for action to forces deployed on the ground. Engineers of the Air Materiel Command rig a small "extractor" 'chute and a 90-foot ribbon 'chute to the gun. The little one pulls the cargo load backward through the big rear doors of the Packet. Once in the clear, the big 'chute blossoms and the load of more than a ton floats safely to earth.

This method, the AAF has announced, makes possible air-delivery of cargo limited only by the size of the Packet's large rear doors.

The spectacular abilities of the Packet have made it a highly efficient tool in the hands of cooperating Air Forces and Ground Forces.

They are abilities conceived by Fairchild engineers — abilities that stem from a quarter century of aviation experience that creates "the touch of tomorrow in the planes of today."

Fairchild Aircraft

Division of Fairchild Engine & Airplane Corporation, Hagerstown, Maryland

American's new fleet of DC-6's now flying...

All of the American Airline's DC-6 flagships now operating are equipped with the Sperry A-12 Gyropilot and Gyrosyn Compass. These Sperry instruments give American's pilots the double advantage of complete gyro-stabilized control and accurate directional indications under all flight conditions.

...with Sperry A-12 Gyropilot at the controls

This versatile electronic automatic pilot applies gentle but alert control corrections precisely as needed, helping the human pilot to do his job better and with less effort than by manual manipulation of his controls.

...for greater flight smoothness, comfort and enjoyment

The A-12 Gyropilot eliminates over-control, "hunting" and "wallowing" ... brings to passengers the flying comfort, relaxation and enjoyment of a plane held in smooth flight under all conditions of air turbulence.

AND IN THE MARINE FIELD, *Sperry Gyro-Pilots, linked with Sperry Gyro-Compasses, are providing automatic straight-line steering.*

Sperry Gyroscope Company, Inc.

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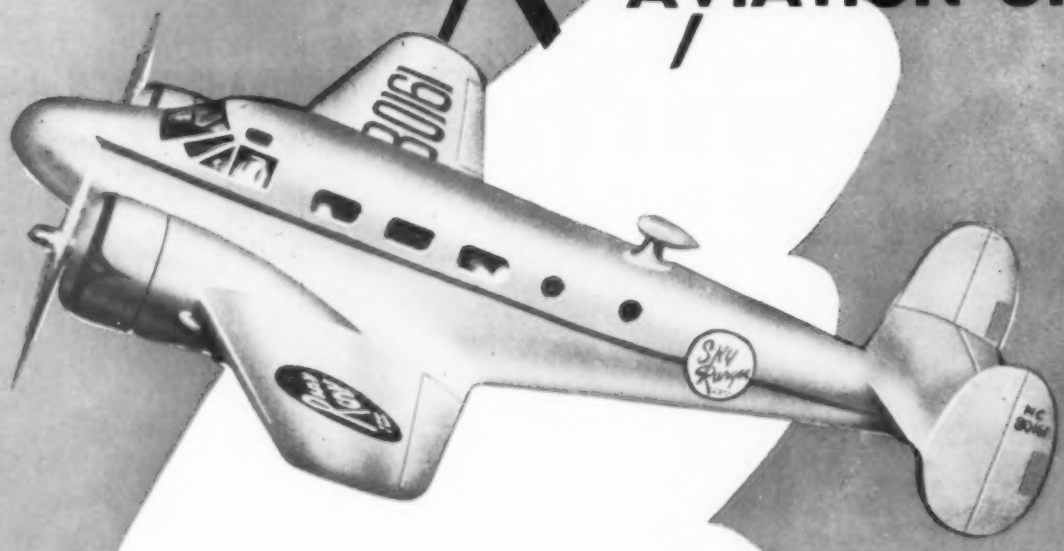

SKY RANGER is a new aviation oil . . . designed specifically for aircraft engines. SKY RANGER sets a new high standard of lubricant performance . . . offers new safety and protection for your engine.

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OIL REFINING CO. of TEXAS

FORT WORTH, TEXAS

SEPTEMBER, 1947 VOL. XXVIII, NO. 3

Southern FLIGHT

including MODERN AIRPORTS

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AIR Report

SIGNIFICANT TRENDS IN THE NEWS

Cessna's Model 170

Latest reports indicate Cessna's low-cost 4-place Model 170 will be powered by a 6-cylinder 145-hp. Continental engine, equipped with fixed-pitch propeller. It closely resembles the 2-place Model 140 in general appearance, with many parts interchangeable with that model. Cruising speed is expected to be 130 mph. or better. Production, pending CAA certification, is expected late in the year.

4-Place Luscombe Tests

Although Luscombe steadfastly refuses to quote a price on its 4-place, 165-hp. Model 11, a spokesman said at least one order had been accepted. CAA certification tests are in the advanced stage, with hopes of successful culmination on or about October 1. Meanwhile, an NX demonstrator, unveiled at the Flying Farmers convention in Oklahoma, was flown to Wichita, Kansas, Los Angeles and return by Test Pilot Bob Burns and President L. H. P. Klotz.

Airport Aid Projects Active

Denying complaints that legal "sifting" had bogged the program, 4th Region CAA Airports Superintendent Ed Travis says Federal-aid airport projects are "really humming" and that building activity will be accelerated during the coming months. Bastrop, La., project was first to be started in 4th Region, Plainview, Tex., being second. Reluctance of engineering firms to accept "small" projects is major delay at present, he added.

New Assistant Secretary of Commerce for Aeronautics

Don't look for any high sounding, prophetic aviation pronouncements from John R. Alison, 35-year-old former Flying Tiger, newly appointed assistant secretary of commerce who replaces William A. M. Burden, resigned. Despite criticism in various isolated quarters that Alison's principal interests will be "heavy" aviation, i. e., military and transport, Alison is boning up on civil aviation problems in general and points with pride to his experiences in light liaison planes during the Burma campaign. Expressed fears that his extreme youth and apparent inexperience with civil aviation problems might cause trouble between him and CAA Administrator T. P. Wright are also unfounded. Alison expressed high regard for Wright's ability and experience during an interview last month with a SOUTHERN FLIGHT editor.

(Continued on page 33)

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Just among ourselves

EDITORIALS

DR. HENRY G. BENNETT

IF any one man was more responsible than any other for recognizing the national significance of what was originally a Sooner state phenomenon just three years ago, it is Dr. Henry G. Bennett, president of Oklahoma A. & M. College, mother institution and now the permanent home of the National Flying Farmers Association. The sight of 392 lightplanes bringing 709 people to the national convention of that organization last month to the college campus at Stillwater, Oklahoma, must have been a source of deep satisfaction to the 60-year-old president of one of the nation's outstanding land grant colleges and to all his fellow workers who contributed to the meteoric success of the flying farmers movement.

A pioneer supporter of the flying farmers, Doctor Bennett is also a pioneer believer in the use of personal aircraft. He has an airplane and a pilot at his disposal day and night. He now virtually refuses to drive a car on trips longer than 100 miles. He covers the state's agricultural experiment stations regularly by air, and on one not unusual day last winter, he flew 700 miles to fill speaking engagements in two Arkansas cities, returned to the college to preside at a farm meeting in the afternoon, took in a Rotary Club banquet in southern Oklahoma that evening, and was at home in bed by midnight. We heard him tell this year's gathering of flying farmers from 34 states that he now has a million and a half air miles on his personal log.

"Future air age, nothing!" he exclaims. "Around here we're in the middle of it right now. In the more spacious sections of this country the airplane is already an essential piece of farm equipment. It brings the greatest pleasure to farm families. Men and women who love the soil have heretofore been forced to pay for their independence in loneliness and isolation. For them, flying is not only fast, sometimes life-saving transporation, it is almost a new way of life. In reality, the future of the flying farmers is in waiting for the rest of the world to catch up with them. Airways for private planes that crisscross our nation, well marked towns and airports, air strips within walking distance of our shopping centers, air strips near recreational centers and lakes—these are the greatest needs of the flying farmers."

It is unfortunate that more of our colleges and universities don't have Doctor Bennetts around. There are a few airwise institutions of higher learning throughout the land where men of Doctor Bennett's vision and progressiveness have included aviation courses in the curricula and applied the airplane as a vehicle of transportation and a piece of equipment equivalent to a chemistry laboratory or the newest in milking machines to better prepare young America for their adult years in a modern world. You can count those institutions on the fingers of two hands. Yet no more fertile, natural or logical place exists than in our schools and colleges for the transformation of the will-o'-the-wisp air age into a living, tangible reality.

Don't think for a moment that the young men and women under Doctor Bennett go forth from Oklahoma A. & M. afraid to fly, ignorant of the specialized utility of personal airplanes, scared off by overplayed newspaper accounts of transport crashes, or insensitive to the desperate necessity for military strength in the air. Even though they might not attend one lecture or go near an airplane during their undergraduate days, the very fact they attend an airwise school which accepts the airplane, provides them with "air conditioning" that's lacking from the majority of our volume-production college graduate lines. The Honorable Robert H. Hinckley, erstwhile Assistant Secretary of Commerce for air, recognized these truths back in the late thirties. Remember? And today, the present GI program looks like a rat race in comparison to Hinckley's Civilian Pilot Training Program. The principal reason being that CPT was tied in with the colleges.

There is no doubt that the pioneering efforts of Doctor Bennett in the field of air education and in the application of modern science to agriculture will have considerable bearing on the wider acceptance of aviation education throughout the nation. For that, all aviation owes Doctor Bennett a debt it can never repay.

SIGNIFICANT DECISION

COUCHED under a most unattractive title, known simply as Docket No. 2002, is what soon may prove to be the most important Civil Aeronautics Board decision of 1947. Docket 2002 clarifies all of the questions which developed from the operation of the nation's first certificated feeder or local service, that of Pioneer Air Lines, Inc.

Until this momentous decision was handed down, there was very little hope for the success of the experimental three-year local operations. Without a clear-cut policy, without incentive to activate certificates already granted, for a while it appeared that the feeder line bubble would burst and be forgotten. The recent CAB decision, however, has injected new life into the feeder line bloodstream. It appears now that all of the dormant certificates will be activated, that the new airline entrepreneurs can attract the large amounts of capital needed to get going. The Board has provided the necessary incentive (subsidy is a horrid word) for the certificate holders to operate economically, and insofar as public convenience and necessity are concerned, vigorously develop passenger traffic on the short haul systems already approved.

Docket 2002 establishes a sliding scale of mail pay between 25½ to 45 cents per aircraft mile flown, depending entirely on the load factor and

(Continued on page 48)

The Birdmen's Perch

By *Major Al Williams*, ALIAS, "TATTERED WING TIPS,"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.

Here are some bits of news we picked up in the last month.

Of course they're about our favorite subject—flying—and our favorite people—them as does it!

They put a *solid brass* model of a new jet job into a transonic wind tunnel and wound the wind up to 850 mph. The trailing edge of this *solid brass* model melted away like butter! (Make a note to keep your putt putt down to placarded speed.)

Another thing we note with great relief is that thunderstorms are not as bad as most pilots have thought. The Army's been digging out the secrets of these storms with specially equipped P-61's.

The big night-fighters flew through thunderstorm after thunderstorm, collecting data, and the weather pilots swear that they're nothing to be afraid of *if you've got blind-flying instruments and are skillful in their use.*

And here's one last bit:

The huge PB2Y which used to be used by the Fleet Admiral who promised to ride the Emperor's white horse through Tokyo is now carrying fresh fish from Alaska to U. S. points. Refrigeration is achieved by flying at 18,000 feet!

WHILE WE'RE ON FISH . . .

. . . take a fish. Any fish!

Scale him, and what have you got? You've got some fish . . . but you've got a lot of bone, too.

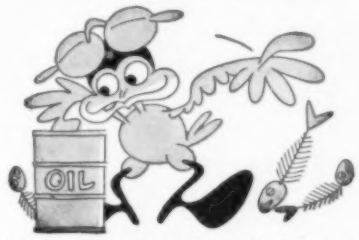
Take out the bone, and what have you got?

Nothing but tasty, nourishing fish!

Now, take an oil. Any oil, as long as it's crude. Refine it, and what you got?

You've got a lubricant . . . but . . .

In effect, you've taken the "scales" off the crude and made a lubricant out of it. And there are still hydrocarbons left in that lubricant that don't lubricate . . . hydrocarbons that make sludge and carbon.



You might call them the "bones" of a crude.

That's precisely why Gulf's Alchlor Process is so important to you. For this *extra* refining step gets *extra* sludge-carbon troublemakers out of Gulfpride Oil.

Now what have you got?

You've got Gulfpride Oil, the finest friction-tamer you ever put in an engine!

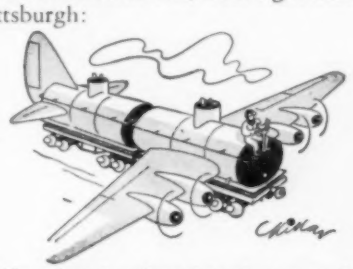
LITTLE KNOWN FACTS DEPT.

"Many pilots forget in emergencies that they can get the equivalent of an extra inch of forward or back stick pressure by running their trim tabs all the way nose-up or nose-down!"

This Little Known Fact About Well Known Planes won a commission as Perch Pilot (bottom rung) for Charles A. Packard, 1321 Arch St., Philadelphia.

You can get a commission, too, if your Fact is as good as Packard's, and is *accompanied with proof!*

Here's another one, from right here in Pittsburgh:



"It takes 2 railroad tank cars to fuel the B-36—21,116 gal. fuel; 1,200 gal. oil!"

That was from T. W. Janssen, Jr., of 6314 Saint Marie St. His commission as Perch Pilot (br) is on the way.

That's all there is to it, fellahs. You send in your "Fact" on a post card or in a letter, enclose *proof*— ! —and if we use it you can join the elegant and exclusive order of Perch Pilots.

And after you've gotten 5 "Facts" in the Perch, you get promoted to Senior Perch Pilot like SPP Charles Miller, of Sacramento!

What are you waiting for?

Address above.

Gulf Oil Corporation and Gulf Refining Company... makers of

GULF **GULF AVIATION PRODUCTS**

DON'T FLY A PLANE WITHOUT CHECKING THE ENGINE COWLING FASTENERS!
LOOSE OR WEAK ONES MIGHT RESULT IN LOSS OF THE COWLING, THE PLANE, OR YOU
...AND WE MIGHT LOSE A CUSTOMER FOR THAT SUPER-ENERGETIC....
R.I.P.
GOOD GULF AVIATION GASOLINE
GULF

HERE'S PROOF— that Edo's NEW 1400 FLOATS will add performance to your plane

Lambros Seaplane Base

George Lambros, Jr.
Owner & Operator

Certificated Instructors
and
A & E Mechanics

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Student Instruction
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Float Repairs

August 6, 1947

Mr. Robert S. Fogg
Commercial Float Sales Manager
Edo Aircraft Corporation
College Point, Long Island, N. Y.

Dear Mr. Fogg:

I thought you would be interested in hearing of the very satisfactory experience we have been having with your new Model 1400 floats on the standard J-3 Piper Cub trainer.

My students all prefer the 1400 floats — so much so that they'll even pass up our other Cubs and wait for the 1400's. They like the Cub with the new 1400's because:

1. The combination gives much better take-off performance.
2. The airplane is much more stable on the water in varying wind conditions.
3. The airplane is much more maneuverable for water taxiing. We are able to make a 360° turn with the airplane turning inside the radius of the wing span.

My chief instructor, Walter Kulik, has made a solo take-off in under eight seconds by the stopwatch from glassy water and with extremely heavy air, the most adverse conditions possible. Dual, a student pilot made a take-off with full tank of gas under the same adverse conditions, in eighteen seconds.

We are planning to convert the rest of our fleet of J-3 Cubs to 1400 floats just as fast as we can, and would advise other operators to do the same if they want a very pleasant surprise. I cannot praise the 1400's for use on the standard J-3 Cub too highly, and will welcome any inquiries from private owners or seaplane base operators as to their performance.

Very truly yours,

George Lambros, Jr.
President

GL/jl

"I can't praise the combination too highly," states George Lambros, operator of one of the country's largest float flying schools.

Edo FLOATS
FOR REAL FUN IN FLYING

Edo's new Model 1400 floats are ready for delivery. They make an outstanding combination with an Aeronca, Luscombe or Taylorcraft, as well as the Cub. Conversion is quick and simple. For more fun in flying, for more sales in operation, put your plane on floats.

EDO AIRCRAFT CORP.
280 Second Ave., College Point, L. I., N. Y.

Flying the 195 Cessna

CESSNA's new Model 195, largest of the postwar single-engine four-five-place executive airplanes with its 300-hp. Jacobs radial engine, 3,350-lb. gross weight and $13,750 price, made its first public demonstrations last month when the first three production airplanes left the factory on tour. Airplane No. 3 was turned over to the writers on its first stop en route to the West Coast and it was check-flown both around the airport and on cross-country.

Introducing many new features over prewar airplanes in its category, including all-metal construction, spring-steel landing gear and cabin comforts, it also has speed—more, in fact, than the company has advertised. But the 195's very roomy and comfortably appointed interior is outstanding.

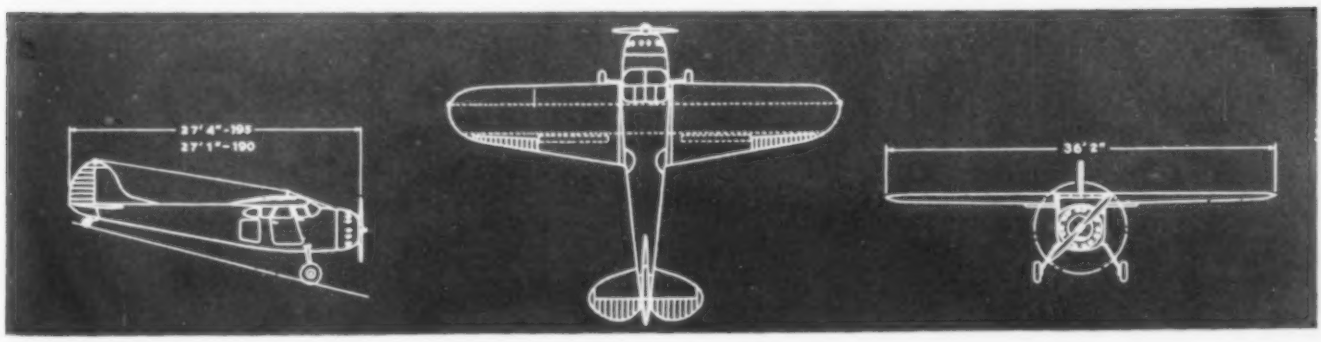
(Continued on next page)

Factory Specifications
Cessna Model 195

Engine	300 hp. Jacobs
Propeller	Hamilton-Standard Constant Speed
Top speed	over 180 mph.
Cruising speed (at 7,000 ft., 70% power)	over 165 mph.
Range	over 700 mi.
Fuel	76 gals.
Oil	5 gals.
Rate of Climb	1,200 fpm.
Service Ceiling	18,300 ft.
Empty Weight	2,050 lbs.
Gross Weight	3,350 lbs.
Luggage Allowable	220 lbs.
Wing section (Angle of incidence 1 deg. at root, minus ½ deg. at tip.)	NACA 2412
Wing Loading	15.358 lbs./sq. ft.
Power Loading	11.166 lb./hp.
Wing Area	218.125 sq. ft.

STANDARD EQUIPMENT: Magnetic compass, vertical speed indicator, turn and bank indicator, air speed indicator, sensitive altimeter, flap position indicator, 8-day sweep-second-hand clock, carburetor air temperature, tachometer, manifold pressure gauge, cylinder head temperature, oil temperature, oil pressure, fuel pressure gauge, electric fuel quantity gauge, ammeter, electrically-heated pitot tube, landing light (left wing only, with switch and wiring provided for right wing), two-way radio, cabin heaters, ventilators, instrument lights, dome lights.

Exceeding Cessna's advertised cruising performance, the new 195 proves its efficiency and comfort in a series of staff flight tests.



Entry is by the single door, a large one measuring 43 by 31 in. and located on the right. A retracting entry step drops down into position when the door is opened and, being spring-loaded, retracts when the door is closed. Entry is between rear and front seats and there is actually sufficient room to allow the pilot to enter last, after his passengers are seated, without crowding them or himself. Both front and rear seats are of foam rubber and spring construction. Both front seats are mounted on slide rails and can be positioned rearward until they touch the back seat. However, extreme care should be exercised that the pilot's seat is locked to prevent its sliding back during take-off or landing; we believe it should be bolted to the floor with a positive-type adjustment assuring a lock in all positions.

Comfortable Cabin

The rear seat is located far enough rearward to leave comfortable leg room. Its width provides plenty of elbow room side to side with two passengers and actually has three safety belts. We tried riding three on the rear, however, and it was crowded. The rear seat back is adjustable to assume three different positions. Upholstering in the cabin, which has comfortable sound-proofing and ventilation, is of two-tone woolen fabrics.

Behind the rear seat is an unusually large baggage compartment, which can be reached while in flight and which has a large exterior door on the right.

Removal of four bolts allows the rear seat to be taken out for cargo. This extends the cargo space from behind the front seats through the baggage compartment — an unobstructed space, front to rear, wall to wall, floor to ceiling, of 85 cu. ft. Space for the pilot to enter and leave the cabin, however, would cut that a bit.

Cabin comfort is also increased, for the pilot, by a unique installation of the General Electric radio's loudspeaker in the wing root near the pilot's left ear. This increased the pleasure of our flight and should effectively reduce pilot fatigue. In addition, the Cessna has headphone jacks for use when desired.

Compact engine installation (left, below) is made possible by the Cessna's hinged mounting. Removal of two bolts on right enables mechanic to swing engine assembly outward for quick accessibility. Oil filler tube is shown behind firewall, with door open. Bottom photo shows simplicity of 195 panel. Only extra is right wheel; throw-over wheel is standard. Knob below throttle is propeller control. Trim tab control is on column.
—(SOUTHERN FLIGHT Photos by Tom W. Collins, except upper right, by Cessna.)

Flight Characteristics

Our check-flight started on a hot August day, 95 degrees and no shade, with full tanks and four persons—the writers and Frank Martin, Cessna factory sales representative for the West Coast, and J. O. (Toots) Womack, Cessna distributor at Dallas. The initial rate of climb was 1,000 to 1,200 fpm. Settling down to a cruising climb, at 115 mph., approximately 83 per cent horsepower, we reached 8,000 ft. mean sea level in 10½ minutes. It was necessary to use considerable right rudder pressure to overcome torque in the climb. The airplane has no cockpit rudder trim tab but trimmed perfectly in level cruising flight.

Several stalls were made with power on and off and flaps up and down. There was no appreciable difference in stalling speeds for the various combinations, which averaged 46 mph. indicated, a true air speed of 53 mph. at 8,000 ft. In stalls and slow-speed turns, the airplane could be accelerated so that the wing dropped sharply in a stall. If the airplane was eased into the stall, and not accelerated, it was necessary to hold it in the stall and with any easing of elevator back pressure the airplane recovered and started flying. The small, drag-type flaps caused a change in gliding angle and speed, but no appreciable difference in trim. Stability and good passenger visibility are favored by the high-wing design.

In approaching the airport for a landing, the Cessna, being a very clean airplane in spite of its fixed gear, took a while to slow down to approach speeds and felt very comfortable downwind at 90 mph., base leg at 85, final at 80 (requiring very little trimming with flaps going down), over the fence at 75, starting to round out the glide fairly high and, finally, landing at about 55 mph. The forward position of the landing gear makes it possible to clamp down on the brakes for a rapid stop with very little tendency to nose over.

The Cessna taxies nicely with the aid of its steerable tail wheel, which is also full castering. But as in all airplanes with a tail wheel and a radial engine, extreme care must be exercised and considerable S-ing done while taxiing to avoid parked airplanes and hazards on the ground.

We had taken off from Mustang Airport and checked the landing at Midway Airport after initial air work.

The production airplane tested by SOUTHERN FLIGHT is shown above at Stillwater, Okla., during the recent National Flying Farmers Association convention.

From Midway we took off for a cross-country cruise check to Shreveport Municipal Airport, Louisiana. We climbed to 8,000 ft. at 115 mph. indicated, which put us on top of scattered clouds. On the step at that altitude our indicated air speed was 155 mph., true air speed 180 mph., air temperature 56 degrees F., manifold pressure 22 in., rpm. 1,950, horsepower approximately 70 per cent.

Approaching Longview, Texas, towering cumulus made it necessary to descend to 6,000 ft. in order to stay CFR, but we cruised at this altitude only 10 minutes before starting our descent for Shreveport Municipal, where we landed after a straight-in approach. Time, 1 hr. 14 min.; distance, 195 miles; speed, 158 mph. block-to-block. We had had cross head-winds, reported by CAA as being 17 mph. from 150 degrees at both 8,000 and 6,000 ft. at Ft. Worth and 10 mph. from 140 degrees at 6,000 ft. at Shreveport. But we would have them as cross tail-winds going back after filling the tanks.

The return flight was made at 6,000 ft. Several checks showed outside temperature 68 degrees F., manifold pressure 23½ in., rpm. 1,960, indicated air speed 161 mph., true air speed 182 mph., and horsepower approximately 70 per cent. Our landing in Dallas was at Mustang Airport. Time 1 hr. 4 min.; distance, 182 miles; speed,

(Continued on page 48)

Frank Martin (left), factory man, explains (below) the 195's electrically-operated flap to Author-pilot Fred K. Dick (center) and J. O. Womack, Cessna distributor.

—SOUTHERN FLIGHT Photos by Tom W. Collins.

Cabin entry step automatically drops into place as door is opened. When door closes step retracts into slot.

Error Chart For Student Instruction

Diagnosing common student errors and suggesting their correction, the author comes up with a useful study.

By A. H. KNOUFF

AFTER many years of flight instructing, I have found it interesting and effective in my student work to create a chart of most common student errors, each with its own diagnosis and remedy. It has served the student and me very well, and goes like this:

In Straight and Level Flight

WING LOW. *Mechanical Cause:* Pressure to one side on stick and pressure on opposite rudder to prevent turning. *Psychological Causes:* (1) Weight of arm pulling stick to that side. (2) Attempting to hold longitudinal axis of plane parallel to flight path in cross-wind, thus correcting for drift by slipping into wind instead of crabbing. (3) Leaning toward side he is looking.

Corrections: (1) Call student's attention to fact that weight of arm is enough to move stick. (2) Tell student to remove feet from rudder, plane will turn toward low wing. Level wings, turn will stop. Explain that instead of pointing nose in direction of desired flight, he should point it sufficiently into the wind that the flight path will be in the desired direction, with all controls neutral. (3) Call student's attention to error and reason. He should always sit straight in relation to plane. Have him follow above procedure when in doubt.

OVER - CONTROL. *Mechanical Cause:* Fighting controls. *Psychological Causes:* (1) Feeling that he should be "doing something". (2) Fighting rough air.

Corrections: (1) Tell student to let go of all controls, plane will return to or remain in level flight. (2) Same as (1). Tell him to ride the bumps and the plane will usually right itself. Catch it with controls only on severe bumps. Show how rudder helps bring wing up.

In Turns

DIVING — INCREASED SPEED —DROPPING NOSE. *Mechanical Cause:* Not enough back pressure on stick to compensate loss of effective lift. *Psychological Causes:* (1) Failure to notice drop of nose or increasing speed. Not realizing need for increasing lift. (2) Difference in apparent position of nose in right and left turns in side-by-side airplane, error occurring in turning to student's side.

Corrections: (1) Tell student "Hold nose up. Since your lift always acts perpendicular to the wings, it is pulling at the angle instead of directly against gravity in a turn. Therefore you need more lift than in level flight. To get it you increase the angle of attack of the wings by holding slight back pressure on the stick." (2) Execute proper turns in each direction, calling attention to apparent difference of position of nose in relation to horizon.

CLIMBING — EXCESSIVE LOSS OF SPEED — NOSE TOO HIGH. *Mechanical Causes:* Too much back pressure on stick. *Psychological Causes:* (1) Incorrect estimate of nose position. (2) Usually misjudgment caused by failure to realize difference in apparent positions in right and left turns in side-by-side plane; error occurs in turn to side opposite student.

Corrections: (1) Tell student, "Don't get your nose too high. Drop your nose a little." (2) Execute correct turns, calling attention to position of nose relative to the horizon.

INCREASING BANK. *Mechanical Cause:* Failure to relax aileron pressure on stick after bank is established. Failure to exert some opposite aileron pressure on stick to compensate overbanking tendency. *Psychological Causes:* (1) Misunderstanding that pressure must be held to continue the turn. (2) Relaxing aileron pressure and failing to notice that bank continues to increase.

Corrections: (1) Explain that pressure on any control produces movement or change in the attitude of the plane. As long as aileron is held, bank will continue to increase. When desired bank is established, pressure on stick must be relaxed to stop banking movement. Suggestions: "You are banking too steep; don't let bank get steeper. Neutralize your aileron." (2) Be very careful in correcting relaxed aileron pressure or skidding may result. To intelligent and advanced students you can explain, "The tip of the outside wing has to move farther than the inside wing. Therefore, it moves faster and produces more lift. This greater lift on the outside wing tends to make it come up and roll the airplane into a steeper bank. To overcome this you must hold just enough opposite aileron to hold the bank constant."

DECREASING BANK. *Mechanical Cause:* Holding opposite aileron pressure. *Psychological Cause:* General tenseness and fear that plane will roll over on its back, usually evidenced by leaning away from bank. (2) Overcorrection for over-banking tendency.

Corrections: (1) "Don't hold opposite aileron; relax." (2) Make student sit upright in relation to plane. (2) Explain reason for banking, comparing with automobile racetrack or turns on horseback. Execute some really steep banks. (3) In persistent cases, bet that student can't put plane on its back and keep it there.

SLIPPING. *Mechanical Cause:* Holding opposite rudder and inside aileron pressure. Insufficient right rudder in starting a right turn. *Psychological Cause:* Trying to hold nose up with rudder.

Corrections: Call attention to feel of sliding along seat toward inside of turn. Tell student to relax on rudder. This will reveal excess aileron pressure, as plane will tend to steepen bank. Explain that nose is kept up with the elevators, not the rudder. Demonstrate to student that because the results of torque tend to turn the plane to the left, more right rudder must be used in turns or other maneuvers with power on, than left rudder.

SKIDDING. *Mechanical Cause:* Holding rudder after turn is established. Holding aileron pressure opposite turn and forcing turn with inside rudder. *Psychological Causes:* (1) Misunderstanding that rudder must be

(Continued on page 48)

Comanche Chief meets the author's Luscombe and two Stinsons at strip adjoining Craterville Park (above). After Ercoupe lands, visitors mount ponies (right).

OVERNIGHT FLIGHT PARTY

By SQUIRE HASKINS

WE found a place that looked promising to fliers seeking somewhere to go and the editor sent us to try it out—with a party of other lightplanes accompanying our Luscombe. The test-trip developed into the swellest flight party we've ever been on—and the best part is that others can duplicate it at only ten bucks per head in overnight parties of 20 or more.

Craterville Park is two miles north of Cache, Oklahoma, in Indian Territory foothills (see accompanying map for courses and distances). A turf field adjoining the Park has 2,500-ft. and 1,500-ft. strips; fuel, unavailable, can be obtained at numerous nearby airports going or returning.

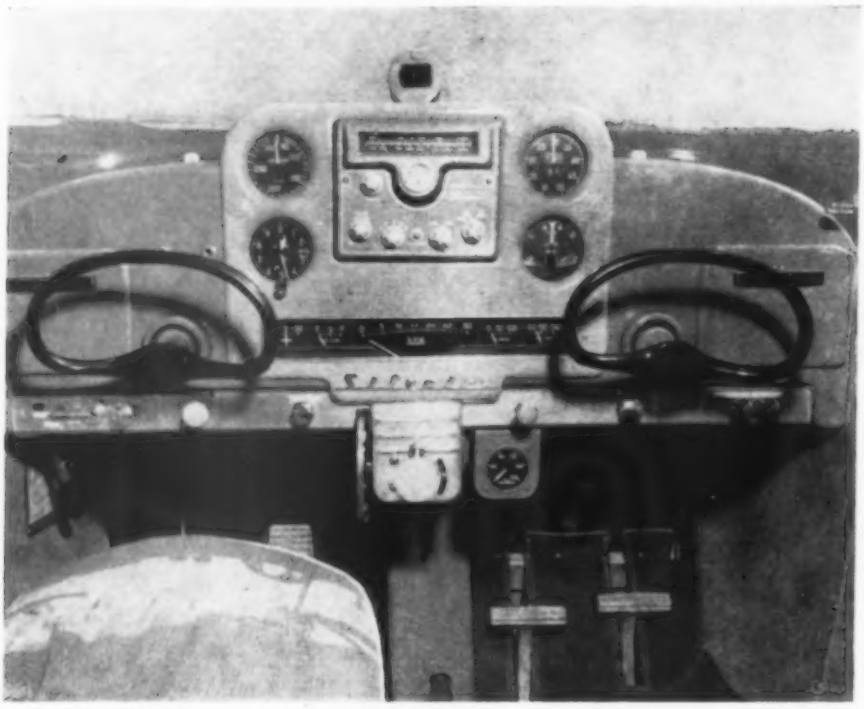
Cowboys and up to forty cow ponies for arriving guests meet incoming planes. Arrivals should be timed for before 4:30 p. m. or within 1½ hours of ETA (there are no lights). Guests are lodged in a comfortable bunkhouse. Amusement park and ranch facilities include trail rides through the hills, swimming and fishing, miniature golf, roller skating, ferris wheel, merry-go-round and square dancing and singing.

But the big deal is in the eating. Each flight party guest gets a 4-lb. steak supper, breakfast the next morning and a box-lunch. Everything's counted in the ten-buck fee. But don't forget the reservations with Frank Rush, Jr., the operator. ★ ★ ★

That's a 4-lb. steak Frank Rush, Jr., is turning (below). In flight party from Dallas were John J. McGinn, Sweetie Davis, Rubye Thompson, Mr. and Mrs. J. C. Lane and Gladys Kefauver. The trimmings (right) heaped plates high. P. S.: Nobody ate all the steak.

—(SOUTHERN FLIGHT Photos by the Author.)

Lightp



STUDEBAKER AUTOMOBILE ENGINE PANEL is used in new 4-place Luscombe, expected to be lowest-priced 4-place in 165-hp. class. It has tachometer face in speedometer.

By T. B. HOLLIDAY

THE poor man's airplane must have some of those luxuries that give safer, more comfortable and faster flight.

Radio communication and radio aids to navigation are required in service aircraft. Inadequate instruments would be unthinkable. Good gyroscopic instruments that will hold a heading for an unbelievable time are available. The service pilot has a compass that is steady as a rock compared to those we usually find in the cheap airplane. Even fighter types of airplanes have been equipped with automatic pilots, a luxury which had been reserved for heavier airplanes. All of these things became commonplace when luxury gave way to necessity.

Luxury became necessity in a very few short weeks of Air Corps history. Those weeks embraced the air mail episode. One can imagine the dilemma into which the commanding general of the Air Corps was thrown when his commander-in-chief asked if the Corps could take over the carrying of the mail. Behind were years of lean budgets that barely covered a few dozen airplanes. Radio was a luxury and only enough sets were procured to cover tactical exercises. Aircraft were equipped with radio only when they were used in those exercises. Funds were insufficient to cover ground lighting installations, so most Air Corps fields were not lighted, even though the Air Corps had pioneered night flight and the first commercial airway.

In short, to say "no" was to have confessed that the Air Corps had not fulfilled its mission, though there was ample reason as to why it could not. To say "yes" was to risk success and that was the chosen course.

That experience revised thinking about luxuries and necessities. From that time, radio instruments have grown and improved as "standard" equipment. The commercial airlines adopted luxuries as necessities much faster than did the military services.

The private flier's problem differs from those of the commercial and military services because he must consider cost. Performance, weight, reliability and life are all given first consideration by the services, and cost receives only secondary consideration. The private flier will place cost ahead of weight and in some cases, life. Often cost is more important than performance and reliability. As a result of this thinking we find a compass in our cheap airplanes that seems to always read anything but the heading of the airplane. The pilot who is trying to read that compass may have used a gyro stabilized compass, and may wish he had one in this airplane, but he still does not want to or can not pay half the price of his airplane to get it.

Approaching the problem from another direction, let us study the automobile where cost is always first. We would not have one that did not have a starter. In fact, automobile manufacturers threw the crank away some years ago. We would complain if it did not have a heater. We accept windshield wipers as necessities. Most autos have radios. The seats are comfortable and adjustable. Access is easy.

However, the market for private planes does not and will not compare with that of automobiles until the two are merged into one vehicle. In the meantime, there may be a compromise by which some of today's luxuries can become standard equipment.

Some luxury items have been listed already. Those and others do or can depend on electrical power. Therefore, the cheap airplane must have a generator. A 300-watt unit should be ample. This is about the size that is used in most modern automobiles. We have two choices. We can have a ten-pound design with a factory cost in reasonable quantities of approximately $150, or we can adapt an existing automotive design for a factory cost of about $15, but it will weigh approximately 20 pounds. Ten pounds or $135—let's take the pounds.

Of course this choice ties the cheap airplane to the automobile's 6-8 volt electrical system, but it should be quite satisfactory.

The engine starter can also be taken directly from standard automotive equipment and adapted to the aircraft engine. It will cost another $15 and 20 pounds. It might be possible to save the 20 pounds by making the generator serve as a starter. Such a design will require the addition of special windings in the generator and some sort of protective clutch to disengage the generator in case of backfire. Such special equipment adds greatly to the cost. It's a choice between pounds and dollars.

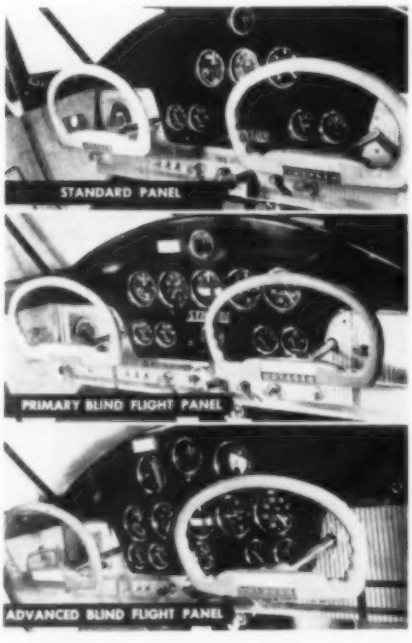
The starter will need a battery. Here, it is likely that the aircraft design will be cheap enough. A 17-ampere-hour battery should be adequate, and it will weigh little more than 20 pounds. The aircraft design is already properly vented and each cell has a thoroughly proven vent plug. This would be a three-cell battery instead of the familiar six- and twelve-cell units, but

*The author, a veteran of 17 years in aviation, was a Colonel at Wright Field during World War II, where his aircraft electrical equipment developments won for him U. S. and British decorations. He has also been honored by the American Institute of Electrical Engineering for contributions to aviation electricity. Col. Holliday is president of Mueller Accessories, 4750 W. North Ave., Chicago, Ill.

plane Luxuries —Why Not?

the cells can be the same. This battery is lower in weight than any comparable automotive battery, and the manufacturer has accomplished such reductions expecting some compensation in better maintenance. The aircraft battery will not withstand the abuse and lack of care that is usually the fate of the automobile battery. A standard automotive battery could be adapted for aircraft service by adding the cell vent plugs mentioned above, but it is likely that the least weight would be approximately 40 pounds.

Probably the most important luxury is two-way radio. Can we use existing automotive sets in aircraft? This writer is not in position to make an estimate, but anyone can recognize the performance and value in many of the automobile radio receivers. It should be possible to substitute tuning coils to change the frequency band, and to add a phone plug, if desired, to the loudspeaker. These changes give us a good receiver. Then it may be possible to use a portion (audio) of the receiver with a single tube to get a low-power transmitter. If these changes can be made economically, great sources of supply for aircraft radio equipment can be tapped to the advantage of the buyer.



THREE PANELS are offered for 4-place Stinson, each being a low-priced, complete, factory-produced unit. Such ingenuity and pricing has made Stinson top sales leader in lightplanes.
—(Stinson Photo)

When the airplane has a source of electrical power, many vexing problems are simplified. Retraction of landing gear is desirable because it increases the efficiency of the airplane. Retraction has been omitted from many designs, because the work of lifting the wheels would have to be done manually. It is easy to add an electric motor which does that work far more easily and quickly. In this case a luxury is added because it is easy to do it.

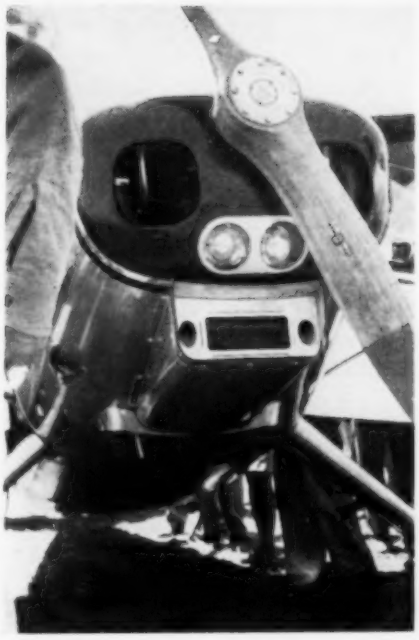
The automobile can contribute only engine instruments to the airplane. Admittedly, the automotive solution for such instruments is far cheaper than aircraft designs. Use of electrical power makes it possible to adapt such instruments to aircraft.

Cheap Gyros and Auto Pilots

When other instruments are studied, particularly those for weather and night flight, it is apparent that the gyroscope is very important. The gyroscope is the heart of automatic or stabilized flight. It is the vital core of blind take-off, flight and landing. It is the key to the pilotless aircraft and missiles of future wars. But good gyroscopes cost a great deal of money.

Most recent developments in gyros have centered on electrical designs. The gyro is nothing more than an electric motor in whirligig supports. These supports allow the axis of the motor to remain fixed or rigid with respect to space, regardless of the evolutions of the airplane. The indication of a good gyro is almost as inflexible as the horizon.

The cost of the gyro is proportional to accuracy, and it is here that the private airplane may gain some important dollars. Ten hours at 400 mph. is 4,000 miles and such a trip will soon be routine for our larger commercial and military aircraft. A good gyro is needed, because the navigation to find a small island at the end of such a trip must be absolutely correct. In contrast, a private pilot's trip of three hours at 150 miles an hour is little more than a tenth of the larger plane's mission. Therefore, ten times the error of the fine gyro can be tolerated. If all of this error were actually allowed the cheaper gyro should cost only 1/100th that of the precise instrument. Such cost would be well within the ability of the private pilot. An entirely suitable electric gyro should not weigh more than four pounds.



NOSE LIGHTS on 4-place Luscombe offer large reduction in costs, eliminating wiring in wings and separate fitting for each wing. Here both are one unit, close to engine electrical system.
—(SOUTHERN FLIGHT Photo)

Having found a suitable gyro, the way is opened to other luxuries. For example, two instrument manufacturers have merged the compass and directional gyro. The combined instrument has been eagerly adopted by military and commercial services, since it performs so nicely that it immediately becomes a necessity and replaces both of its predecessors. Perhaps we can look forward to a cheaper version of the magnetically-corrected directional gyro.

Another luxury that hinges on the gyro is the automatic pilot. If a second gyro is added to the directional instrument described above, all necessary elements for signalling the attitude of the airplane are present. Add simple electric servos at each control surface and connect them to the gyro signals by relays and we have a simple relief pilot. It should not weigh more than 20 pounds, and maybe it will not cost much more than $50.

By adapting proven equipment from the automotive field, much can be done to improve our cheap airplanes. A hundred pounds and a hundred dollars will add electric power and starting and perhaps a two-way radio. And it will open the way to other luxuries. ★ ★ ★

Four-place Luscombe (above, left) and Cessna 195 (background) were among new planes exhibited at Stillwater, Okla., convention. Flying tour of Hereford Heaven ranches featured the meet.

Flying Farmer

A GLANCE over the variety of airplanes flown from all parts of the nation and Canada to Stillwater, Oklahoma, for the Flying Farmers Association's second annual convention last month showed most of them to be 1946 and 1947 models, many being 4-place types. Approximately 400 lightplanes brought more than 7000 Flying Farmers to the impressive roundup. There was only an occasional surplus military airplane.

Demonstrations of new and seldom-seen not-so-new lightplanes featured the exhibition. These included Luscombe's 4-place Model 11; Cessna's 4-5-place, 300-hp. Model 195; Stinson's latest Voyager and Station Wagon; Fairchild's improved

Planes seen at Stillwater included those at left. From top down are Rawdon tandem trainer, with 125-hp. Lycoming; 2-place 125-hp. Callair from Wyoming; an NC'ed surplus Culver PQ-8 with 150-hp. Franklin, and Billy Parker's 1912 pusher. Below are farmers at registration desk.

Farmers inspecting the 165-hp. Luscombe (above) included Milton Rusco, St. Johns, Kansas, shown at right signing order for first delivery. President L. H. P. Klotz (holding paper) made the sale.

ers Roundup

Rancher; C. G. Taylor's improved T-Craft; Aeronca's Farm Wagon; Bell's crop-dusting helicopter; new PA-11 Cub; Funk's silver-painted new deluxe 85; Temco's revived 125 Swift; Rawdon Aircraft's newly NC'ed trainer; the CAA's Cub with cross-wind landing gear; Bellanca Cruisair, Call Aircraft's new 125-hp., 2-3-place A-3 Callair, and Billy Parker's 1912 pusher.

A new feature was an air tour of famous ranches in the rich Hereford Heaven area, with a barbecue on the ranch of Gov. Roy Turner as the high spot. FFA voted to use an existing aircraft insurance plan rather than create one of their own and decided to bring out an association house organ. Forrest Watson of Thomas, Okla., was re-elected president, and newly-elected officers are Alfred Ward, Johnson, Kansas, vice president, and Bert Hanson, Vernon Center, Minn., secretary-treasurer. Oklahoma A. & M. College was host to the convention.

With farm revenues at all-time highs because of prices and excellent crops, FFA gatherings have become a prime gathering place for light-plane salesmen. Many were at Stillwater to demonstrate. Indoor exhibits were few, but booths were notable in their presentations. In time the Oklahoma affair should become one of aviation's leading institutions. ★★★

Personalities at convention included those at right. From top down, left to right, are: 1. President John Friedlander of Aeronca; Bert Hanson, secretary-treasurer; Alfred Ward, vice-president; and Forrest Watson, re-elected president, all of FFA. 2. Sales Managers Lou Davis of Fairchild and Bill Klenke of Stinson, with Luscombe Vice President Gene Norris. 3. Herb Graham, FFA executive secretary (second from left) with John Howard and Bill Campbell, Dallas Bellanca distributors, and George Coles, Bellanca. 4. Derby Frye, Cessna; Bill Berry, CAA; John Burke, Oklahoma City, and Gene McGill, one of FFA founders. Below are Temco's 125-hp. Swift, Stinson and (background) Fairchild.

SOUTHERN FLIGHT.
Luscombe and Oklahoma A. & M. Photos.

Design Revival

BACKYARD designs with 190-cu. in. engines (mostly 85-hp. Continentals) and maximum speeds of about 200 mph. were converging on Cleveland, Ohio, as we went to press, with months of hard work and savings invested by individual builders and pilots for the first crack at the Goodyear Trophy and $25,000 in prize money during the National Air Races. Regardless of who won the event, one thing was certain before Labor Day's finals—the nation's venerable aviation classic would regain the stimulation of design and pilot competition which contributed so much to aviation in prewar years but which was missing in the 1946 revival.

Most of the designs average out as having a Continental 85-hp. engine; wing area of 65 to 70 sq. ft.; tailwheel landing gear; 550-lb. dry weight; 55 to 75-mph. landing speed; 185 to 200-mph. top speed; tube and fabric construction.

Some introduce unique features. Art Chester's "Swea'pea" has a V tail. W. T. Wedding's "Spooky" from Las Vegas, Nevada, which probably wasn't completed in time, provided for a prone position for the pilot.

Details on many of the racers include the following: Gerald C. Francis and Howard Angell, Lansing, Mich., report they have a mid-wing of tube and fabric with 71 sq. ft. wing area, 22½-ft. span, 15-ft. length, 55 to 60-mph. landing speed, 200-mph. top speed. Bill Robinson of Burbank says he has test-flown his fabric-covered low-wing several hours and did 175 mph. It has a 19-ft. wing, 16-ft. length and 550-lb. dry weight. Robert S. Hopkins of Reidsville, N. C., says his NX-1223M "Falcon" low-wing, fabric-covered, has been satisfactorily test-flown and found "slightly better" than 160-mph. with a 75-mph. landing speed. "On take-off, the ship accelerates rapidly and gets off within 1,000 feet and has a surprisingly good rate of climb," he says. "Some dive testing has been done but we have not exceeded 230 mph. We have no meter but we feel sure we have exceeded 6½ G's in some of our pullouts, with no evidence of flutter or structural weakness." The Falcon has a 22-ft. wing and length of 13 ft. 6 in.

Robert J. Johnson, a Northrop inspector at Hawthorne, Calif., has a mid-wing plywood racer, "Flub Dub," with a wing span of only 15 ft. 4 in. and length of 15 ft. He expects 190 mph. Edward F. Allenbaugh's "Californian," with wing span and length both of 18 ft., believes his wing will be the "thinnest" in the competition. Molded plastic covering is a feature of the tubular-steel design.

Other designs, with dimensions and expected speeds, include: S. J. Wittman, mid-wing, 16-ft. wing, 17-ft. length, 190 mph.; Ray Baker, low-wing, 17 ft. wing, 16-ft. length, 185 mph.; Harry Raack, low-wing, 19-ft. wing, 15-ft. 6-in. length, 200 mph.; C. H. Jordan, mid-wing, 16-ft. wing, 15-ft. 2-in. length, 200-mph.; Harold G. Koehler, 18-ft. wing, 13-ft. length, 190-mph.; Arnold Hanes, 18 ft. wing, 15-ft. length, 200-mph.

Complete details of the winning designs will be obtained during the races for the next issue of SOUTHERN FLIGHT.

4-Place Reliability Tour Urged

This year's lightplane race may or may not contribute directly to personal plane improvements in design, construction and performance. Its chief value is that it provides the seriously-needed shot-in-the-arm stimulant necessary for the National Air Races' successful continuance as an institution which has been known to contribute to aviation progress in the past.

But the midgets have already accomplished much in encouraging 1947 aspirants in new design for the event. Progress is certain when as many as 20 or more individuals, in backyard garages, hangars and factory shops throughout the land, incorporate their ideas in 85-hp. racing designs.

An extreme example is the case of R. G. Naugle of Dayton, Ohio, an aerodynamicist who is constructing a tailless pusher but whose entry was prevented by propeller shafting for the

(Continued on page 30)

Representative of 85-hp. designs for the Goodyear Trophy race, the craft pictured at left have extra beef, high stall speeds and extremely light weight. From top to bottom are: (1) "Falcon," built in Reidsville, N. C., withstood 6½-G pullouts and 230-mph. dives; (2) a mid-wing tube and fabric racer, built in Ohio by three girls, including the late Marge Hurlbut; (3) Art Chester's V-tailed "Swee'pea" cockpit, showing extra strength for wing fittings at fuselage; (4) Bill Robinson and his backyard crew at work on their modified Brown design in California; (5) Gerald Francis of Lansing, Mich., sent in this shot of his mid-wing with windshield canopy extending to nose cowling.

Samuel Colt, inventor of the revolver—the great "equalizer" which figured so dramatically in our conquest of the West

Top Speed, 184 mph; Cruising Speed, 172 mph; Range, 750 miles

Walter H. Beech, pioneer in aeronautics, who produced the Beechcraft Bonanza as a modern "equalizer" in business transportation.

A Great New "Equalizer" for the Business frontier... the BONANZA

ONE INDIAN on a horse could send a dozen arrows at a Texas Ranger before the Ranger could dismount to use his long rifle. But to this unequal duel came Samuel Colt's "equalizer"—the six shooter—which stopped the Rangers' enemies in their tracks.

To today's business frontier comes an equally potent "equalizer"—the Bonanza, an airplane built for business, giving town and city businessman alike new mobility and range.

The four-place Bonanza is a fast airplane, cruising at 172 mph, but does it with the economy of 165 hp at a cost as low as one cent per passenger mile! Add the Bonanza's limousine-like luxury, its quietness, and its easy maneuverability in and out of the smallest fields—and you have air transportation that is tailored to fit the businessman's needs!

The Bonanza comes fully equipped—two-way radio, landing lights, instruments, heater, electric retractable landing gear, flaps, controllable propeller and other refinements. Your Beechcraft distributor will be glad to demonstrate it—and to discuss its adaptability to your transportation needs. We are still filling a large backlog of orders. Additional ones will be filled in sequence.

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TEXACO

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FOR THE AVIATION INDUSTRY

Tune in . . . TEXACO STAR THEATRE presents the TONY MARTIN SHOW every Sunday night. See newspaper for time and station.

VOL. VIII, NO. 1 SEPTEMBER, 1947

Modern AIRPORTS

At Clifton, Tenn., (pop. 850) two brothers built the excellent facilities shown here. As rent, operator pays 5 per cent of gross and agrees to furnish transportation to town. Kentucky Lake is half-mile away. Details on page 23.

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What Makes A Manager?

A recent survey discloses business and engineering ability outranks aviation experience as requirement.

By JOE COULTER
Manager, Max Westheimer Field, Norman, Okla., U. of Oklahoma Airport Management Instructor

ARE airport managers pilots, engineers or business men? What is their training and experience? What type of college training do our present airport managers recommend for those planning a career in this field? How important is pilot ability to successful airport management?

Realizing the controversy that exists concerning the qualifications of airport managers, the answers to these and other questions were sought by the University of Oklahoma to improve the curriculum for major work in Aviation Administration.

Since the airport managers of today are made up of a heterogeneous group, each having a different combination of qualifications, it is difficult to determine just what the ideal airport manager is made of. It was decided that if a large cross section of this group were questioned, and their answers tabulated, reasonably accurate conclusions could be drawn. To do this, the Bureau of Business Research of the University, under the direction of Francis Cella, prepared a questionnaire designed to gather the desired information. The questionnaire was sent to airport managers selected at random, but in such a manner that all sizes of airports as well as all sections of the country would be represented. In order to get accurate information and frank statements from those answering, the name of the manager was not asked nor was there any attempt to trace the identity of the airport.

There was an excellent return on these questionnaires resulting in a sufficient number to obtain significant facts from the tabulations. The Class I and II airports were somewhat neglected in this survey since a majority of them seem to be under an operator-manager whose primary duty was not that of airport management. Twenty Class III airports were represented, 24 Class IV, 8 Class V and 4 Class VI and larger.

One of the most interesting parts of the returned questionnaires was the added comments. They reflect strong interest on the part of these men to aid in any program to improve the profession as such.

Piloting Desired, Not Essential

Since so many of the early airports were managed by pilots who used them as a base of operation, it was interesting to see how relatively unimportant pilot ability has become in airport management. This was further emphasized as the size of the airport increased, if the amount of annual salary can be assumed as an indication of the size of the airport. Where there were nine commercial pilots for seven non-pilots holding positions paying from $3,000 to $4,000 annually, they came out even in the highest salary group—over $8,000—with two commercial pilots and two non-pilots. Of the total number of airport managers replying, 48 per cent were commercial pilots, 16 per cent were private pilots while 36 per cent held no pilot rating.

The non-pilots replying did not indicate a need for pilot experience in the performance of their duties; in fact, many were vehement in their remarks concerning the importance attached to flying experience as a qualification for airport managers. In stating the experience gained in other businesses considered most helpful in managing an airport, aeronautical experience was not mentioned by 70 per cent of those answering.

TABLE *A*

Commercial	48 %
Private	16 %
None	36 %

Pilot ratings held by a cross section of airport manager.

It cannot be concluded, however, that pilot experience is not important in airport management. The logical answer is that it is not of prime importance but is one of the many desirable qualifications. A number of the non-pilots reporting indicated a need for a working knowledge of flying and being able to "talk the pilot's language." If these tabulations can be considered fairly accurate, in setting up a course of study for prospective airport managers, it should be sufficient to include pilot training through the private pilot level.

Business Experience

If it may be safely concluded that the airport manager is not primarily a pilot, then the question is whether he is primarily an engineer or a business man. Some of the larger cities preparing competitive examinations for the position of airport manager have stressed the need for an engineering background. This emphasis placed on the maintenance problems of the airport manager is reflected also in the number of former engineers and construction men now employed. In Table B it can be seen that 30 per cent of the airport managers have engineering backgrounds, indicating this profession as a prime source supplying the personnel for this position.

As the airports become larger and the problem of financing them increases in importance, it becomes evident that the airport manager is evolving as more of a business man and less as a maintenance engineer. When asked what type of previous experience they had found most helpful in managing an airport, the answers covered a number of fields including various combinations. Since so many indicated more than one principal field, the results are tabulated according to the frequency of the experiences men-

TABLE *B*

Engineering and construction		30 %
Retailing, Finance, Banking, Mfg.	Business	35 %
Aviation		21 %
Military		4 %
All Other		10 %

Experience before becoming airport manager.

TABLE C

No. of Managers	Type of experience indicated
11	Business, retail and general
8	Business and Engineering
6	Business and Public Relations
5	Bus., Engr., Public Relations
4	Engr. and Construction
3	Aviation
3	Public Relations
3	Bus., Engr., Avia., Pub. Rel.
3	Business and Aviation
3	Bus., Engr., Aviation
1	Engr., Avia., Pub. Rel.
1	Engineering, Aviation
4	Other

What experience gained in other business do you consider most helpful in managing an airport?

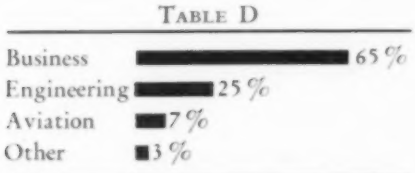
tioned. It is sufficient to note that some form of general business was mentioned by 23 of the 56 managers, while 13 had found their engineering experience helpful. Public relations work was mentioned 9 times, giving it an edge over aviation with only 7 indications.

Just to see what the engineers thought about this, the 23 questionnaires received from airport managers with engineering background or training were taken separately and their opinions tabulated. This group of former engineers voted 9 to 8 in favor of business experience over engineering experience for prospective airport managers. Six favored an aviation background. When this same group was asked what type of college training they would recommend, 14 favored business training while 8 stayed with engineering and one held out for aviation.

Engineering in Curriculum

Since the primary purpose of this survey was to find out the type of training to give students in airport management, this group was asked: "What type of college training would you recommend for those planning to become airport managers?" Their answers can be seen in Table D where

TABLE D



What type of college training do you recommend for prospective airport manager?

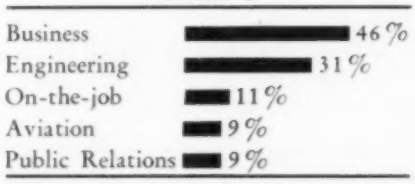
65 per cent recommended training in business courses such as business management, accounting, personnel management, economics and retailing. Twenty-five per cent recommended training in engineering with 7 per cent favoring aeronautical training.

College training alone is not expected to turn out full-fledged airport managers for large municipal airports. Graduating students will in many cases be forced to go into other types of business to gain experience that will help them obtain positions as airport managers. In order to provide more effective counseling for graduating students desiring a career in airport management, it was necessary to know what experience would be advisable for those planning to become airport managers. The answers to this question were spread out over a number of fields indicating a greater diversity of opinion on this item. Forty-six per cent of the managers thought that general business experience would be advisable. Engineering experience was recommended by 31 per cent. Eleven per cent of those answering suggested on-the-job training as assistant managers which would, of course, be ideal. The importance of public relations work was emphasized as important to airport management since experience in this field was considered as essential as aviation experience. Most of those recommending aviation experience suggested beginning as a fixed-base operator, which is generally conceded to provide a good background.

It is difficult to realize the full significance of this poll. There does appear to be a general trend away from the pilot-manager of the early airports, through the engineering-manager of the first large airports on into a business-man type of management. The relatively sudden growth of aviation into big business is reflected in some of the recent choices in airport managers. The financial problems appear to have become more important than the maintenance problems resulting in a greater demand for men with business training and experience.

Since the purpose of this survey was to gain information to aid in the setting up of an academic course of study, no attempt will be made to create or settle any controversies. The source of this information is considered the best available since they are the people now managing the nation's airports. Whether the trends indicated here will continue or new factors will enter into airport management cannot be foretold. These are simply the results of the thinking of today's airport managers, for what it is worth. ★ ★ ★

TABLE E



What business experience would you recommend for prospective airport managers?

This Month's Modern Airport

SUCCESS FOR THE FAITHFUL

By GENE SLACK TEAGUE

IF you happen to be flying across the Tennessee River near the lower end of Kentucky Lake in Middle Tennessee, there is an airport you can't miss. It is the Clifton, Tennessee, airport, airmarked on one of the hangars. And if you land you'll be even more surprised at the long, white-graveled runways, hard as asphalt, and at the three hangars in a row.

Perhaps you will wonder if this little modern airport is not the very spirit of aviation itself, admiring the facility which two men and a town of only 850 people created.

There is one plane per hundred people in Clifton. Fourteen GI students are enrolled in the CAA-approved school. And during the month of last February—the month when flying is usually at its lowest ebb at most fields —109 hours of flying were logged at Clifton.

Tom Frank Hassell and John Frank Hassell, brothers, are in great part responsible for these results. Tom is manager of the airport and John Frank is Commissioner of Clifton. Together, they get things done.

Both the Hassells have been flying for years and travel no other way, which involves considerable mileage in attending to their businesses of general merchandise and large land holdings. Before Kentucky Lake was built they operated from a grass strip on the river, but the lake covered it. So they moved to higher ground on the opposite bank.

From the nearby hills they had chert —a type of gravel—hauled for surfacing. The natural decline of the land provided excellent drainage with some help from the Hassells. Now drainage is so good that when a rain comes they just go out and roll the chert and it gets harder and harder. One hangar was built, then two and finally another added, all since May, 1946. The administration building contains a glassed-in lounge from which the entire field is visible, restrooms and a small radio room equipped with radio (from a BT-13) for receiving weather from nearby Jack's Creek radio range station. Outside there is a concrete observation platform, half circling the building so that there is "always a shady side." In a year they plan to have landscaping done, flowers and shrubs planted, a snack bar installed.

But perhaps the most unique factor about the entire airport is the system under which it is rented to the flight operator. Under the present contract the operator must return 5 per cent of yearly gross income to the airport in the form of improvements. This partly serves in lieu of field rent. In lieu of hangar rent he agreed to furnish transportation to and from town. The airport can't stop growing and improving under such a system. Every day there are things to be done and being done — improvements such as hard surfacing a place in front of the hangars and the ends of the runways so that engines may be run up without damage to propellers from flying gravel.

The field is only one-half mile from Kentucky Lake, where duck hunting and fishing is good. And transportation to boats is ready for visitors, the Hassells say, and boats are furnished.

It is airports such as this and faith in aviation as displayed by the Hassells which are helping to develop private flying everywhere. ★ ★ ★

AIR Reviews

SEPTEMBER 1947

A periodic report on the activities of AIR REVIEW PUBLISHING CORPORATION, publishers of **Southern Flight** . . . **Modern Airports** . . . **Official Directories of U. S. Certificated Aircraft & Airmen** . . . **Air Market Data Service** . . . **Standard Guide to Private Planes** . . . 1901 McKinney Ave., Box 750, Dallas 1, Texas. Also Chicago, Detroit, Los Angeles, New York

A MAGAZINE SERVES IN DIVERSE WAYS

AVIATION has too long ignored home owners, hunters and fishermen who would enjoin private flying from using airports and water bases. It's easy to laugh off such opposition; but there are more home owners and hunters and fishermen than fliers — millions more. Fair or not, illogical or not, their strangling of landing sites is spreading throughout the land.

SOUTHERN FLIGHT'S editors seek to win the opposition over by citing to those critics the airplane's advantages. Airparks frequently enhance property values. Planes perform valuable service by forest fire surveillance, re-vegetation from the air, locating lost or marooned game and stock, spraying for insect and disease control, re-stocking of lakes with fingerling fish, etc.

By opening up otherwise inaccessible fishing and hunting grounds to flying sportsmen, the airplane makes possible new resorts, new business opportunities, new pleasures. Articles in SOUTHERN FLIGHT show how resort operators are finding private fliers a welcome clientele. Misguided groundlings are reminded that there are 400 automobiles for every plane, according to vehicle registrations.

Sportsmen in their unsportsmanlike antagonism may be excused for their lack of facts and logic. But SOUTHERN FLIGHT believes they also should be informed. Thus it is hoped to remove prejudices in the courts and legislatures and to gain more recruits for flying.

Welcome, Temco..

LATEST contract advertising in SOUTHERN FLIGHT is Texas Engineering & Manufacturing Co., manufacturer of "Swift" airplanes.

Temco announced their take-over from Globe Aircraft Corp. in a two-color page advertisement in the August issue. This is being followed by twelve full page ads, several of them in color.

Editors Thrive On Such Stuff

QUOTES from a reader's letter dated August 13, 1947: "Each month you amaze me with the readability you pack into your publication.

"No finer example . . . than the August issue. Every feature and department excellent; three were outstanding.

"As long as you continue such intimate contacts with your readers' interests SOUTHERN FLIGHT will remain 'must' reading among flyers."

(Signed) B. Dudley.

Too Good A Job?

Harry Royster had a page ad in the August issue. Did it sell? Well, "Cut that ad in SOUTHERN FLIGHT off! Been receiving telephone calls, wires and letters about my Douglas parts. You did too good a job; we'll advertise something else."

L. H. P. KLOTZ

President
LUSCOMBE AIRPLANE CORP.

"SOUTHERN FLIGHT is noteworthy for its farsighted, aggressive editorial policies. It is a leader in the promotion of aviation, and certainly is an asset in the nationwide marketing and distribution of the Luscombe Silvaire."

THESE MEN IN THE KNOW..IN AVIATION AND IN ADVERTISING.. ARE IN TOTAL ACCORD ON Southern FLIGHT

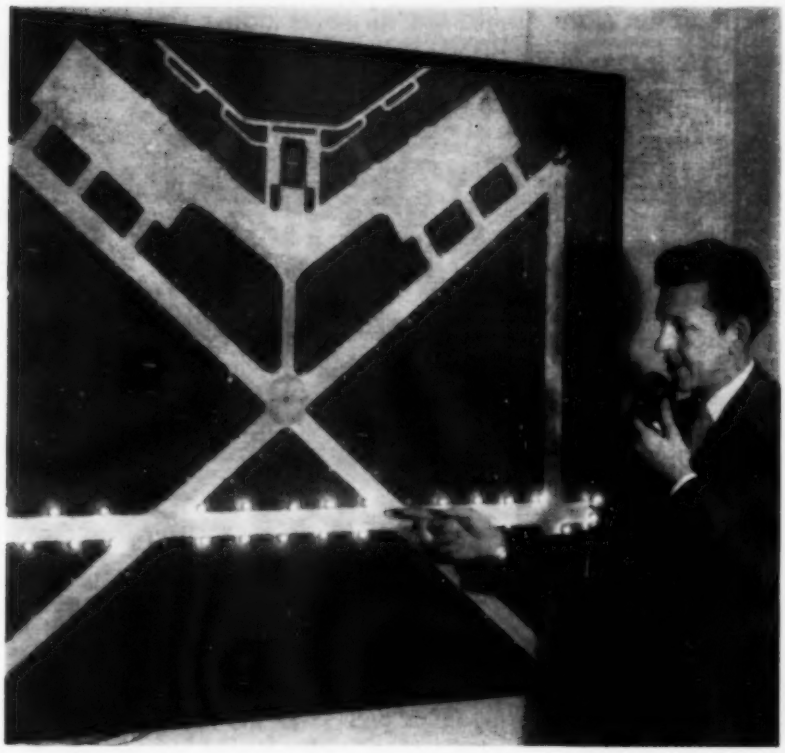
Including MODERN AIRPORTS

MONTY MANN, V. P. & Media Director
TRACY-LOCKE COMPANY, Inc., Advertising, Dallas

"In using national aviation magazines, we find that in many cases the percentage of circulation is proportionately lower in the South and Southwest than in most other areas. This situation makes SOUTHERN FLIGHT a 'must' in connection with Luscombe's national advertising."

Fifteenth of a series

Lights for the Asking



Inventor Corcanges shows how radio signal lights proper runway on model.

SOMETHING new in airport lighting for small municipal and private airports has been operating successfully for several weeks at Mineral Wells, Texas—an inexpensive little gadget that turns on runway and obstruction lights when an approaching pilot, tuned to 3105 kilocycles, mutters the word "Lights!" into the microphone.

Youthful Achilles Corcanges, Mineral Wells radio station operator, who patented the gadget, would like to have suggestions from airport engineers, owners and operators and private pilots as to its numerous uses elsewhere. He obtained permission of the Civil Aeronautics Administration and the town mayor to try it out and the CAA has observed its operation. But beyond that there's nothing definite in the way of plans.

"All I can say is that it works and it is cheap, costing from $50 to a few hundred at the most," Corcanges said. "I perfected it as a service to aviation and without any idea or ambition to make a fortune out of it. I'm hoping aviation will find a way to utilize it.

C. R. Seybold, chief of the lighting section of the CAA's 4th Region headquarters at Fort Worth, is making a study of the installation for a report during the next CAA conference on lighting. SOUTHERN FLIGHT editors accompanied Seybold and S. E. Travis, Jr., 4th Region CAA airports chief, in a flight test of the Mineral Wells installation.

As the CAA twin Beech neared the town, the transmitter was tuned to 3105 kilocycles and George E. Haddaway, editor, blasted, "Lights!" into the mike. Sure enough, the darkened airport blossomed into lights a thousand feet below and three miles off the left wing. Eddie Warner, flying the CAA Beech, landed and the lights automatically doused themselves at the end of eight minutes after going on.

Corcanges exhibited the mechanism, housed in the airport's equipment building. It was a homemade assembly including a ham operator's receiver and a small, inexpensive "trigger" set which closed the airport lighting circuit when the signal was received from the approaching aircraft. A simple timer opened the circuit to turn off the lights at the end of eight minutes.

The Mineral Wells airport doesn't have one, but a wind tee, if connected to the gadget, would cause only the proper runway to be lighted.

There are adjustments yet to be made in the device. It is tuned so that signals broadcast on its frequency beyond a certain distance are not strong enough to trigger the switch, in this case the distance being less than 15 miles. Otherwise distant transmissions for airports elsewhere would interfere.

Many Possibilities

"Chief possibilities for remote triggering of airport lights by aircraft radio include its use at small airports and seadromes where neither all-night lighting nor all-night supervision for intermittent lighting can be afforded, because of the costs," Seybold said. "Many small municipal airports have lighting systems installed but are unable to operate them continuously at night or to employ a man to turn them on and off on call.

"High intensity lighting of large airports may offer possibilities for such a gadget. Pilots who have tested these lights have commented from time to time on the need of some method by which their intensity could be controlled from the approaching airplane by radio. Lights intense enough to be visible at a distance through fog or low-visibility weather become too bright once the pilot lets down and approaches the runway. If the pilot could trigger the runway lights by radio, so as to decrease their intensity, the development of airport lighting for all-weather flying might be nearer perfection."

Travis pointed out that another lighting innovation is being tested also at Mineral Wells. It is a gadget that automatically turns on hazard lights atop the ad building when triggered by the sound of an approaching aircraft.

Both radio and sound triggers would have possibilities in operating airway beacons for navigational aids, air markers and hazardous obstacles and areas.

Pioneer Airlines has schedules through Mineral Wells but does not depend on automatic lighting. Regulations require that a "capable person" be in attendance during darkness to operate the lights if they are not burned continuously at night. Therefore the regulations would have to be altered if automatic devices were to replace night operators at small fields used by airlines.

Since word got around that a call on 3105 kilocycles within fifteen miles would light the Mineral Wells airport, curious pilots have entered into the service test being conducted with Corcanges' gadget. Hardly a night passes but what some pilot, with no thought of landing, triggers the runways "just to see if the gadget really works." It averages "working" in such tests about three times nightly while pilots fly on, unmindful that their unidentified signals are building a successful record for a device that may some day be widely utilized. ★ ★ ★

Benefits from municipal airports can not be valued in dollars alone. They provide assets for communities as well as aviation.

Non-Operating Income

By
JOHN H. FREDERICK and CHARLES L. VYCHOPEN

PART II—INTANGIBLES

AN efficient, well-managed airport is an asset to any community. It not only helps strengthen the community's position with respect to the air age of travel, but it also contributes to its prosperity in many ways. Even though an airport may prove to be a deficit as far as revenue from its operations is concerned, there are a great many intangible benefits to the community simply because it has an airport.

Community benefits that result from an airport may be mentioned as follows: The city is on the air map. Air travel is permanently established as a major method of transportation and aviation is vital to the national defense. Therefore airports can no longer be regarded as experiments. Municipalities are now viewing their airports in much the same light as a street system, public works system, or any other standard municipal service. Looking at the airport in this light, and looking at it from the financial viewpoint, it can readily be seen that most airports have not become self-supporting city services. Airports are, however, revenue-producing facilities with a greater potential than previously supposed. The desire of most municipal officials to place airports on a self-supporting cash basis obscures the intangible benefits or income that may be derived by a community from its airports.

The intangible revenues indirectly benefiting the community in turn benefit the airport in the form of certain "increments". Any community expecting to keep up-to-date and desiring to receive any benefits from air transportation must realize several facts. First of all, the cash basis approach is very important and will prove of benefit in trying to operate an airport as a commercial enterprise. Secondly, it is also necessary to keep in mind the fact that even though an airport might not be self-supporting and so be somewhat of a burden on the community, it is still an essential part of any community and, therefore, must be maintained in the best possible manner. If it is not so maintained, because it cannot justify itself from the revenue standpoint, then that community will find itself by-passed in air travel and air shipping.

Very much the same situation was faced by those who sought to justify the paving of highways, the establishing of parks and recreational areas, the development of Chambers of Commerce, and in general the improving of a city in terms of the revenues such things can produce. Such assets to a city do not produce direct revenues, but taxpayers and city officials now know that properly maintained streets and roads and paved highways are more than justified in that they attract business to the community amounting to many times over the cost of providing them, as well as providing for the needs of the community itself. By the same token, parks and recreational areas do the same thing. In themselves, they have no revenue producing powers, but by the very fact that they are established and are things of interest and beauty they create revenue which cannot be placed specifically on a dollar and cents basis. The same is true of an aggressive Chamber of Commerce which places a community "on the map". The airport must be looked upon in the same light.

The airport is a medium by which traveling salesmen and other business men, air passengers of all types, tourists, air mail, and cargo can contribute a direct share to the prosperity of the community. The salesmen and business men do so by patronizing the hotels and restaurants as well as other establishments; the passenger and tourist will do likewise, and in some cases many of these same people who enter the town through an airport, will come back to establish their residences or businesses there.

It can be easily seen how the airport adds many intangible income items when viewed in the proper light. No community can afford to be by-passed by the dollars they might be able to receive from the commerce carried on through an airport. The profits that might show on the books of any airport will never disclose the "increments" developed for the community as a whole.

Benefits From Airline Operation

Little thought has been given to the fact that by the very existence at the airport of airline services an extensive amount of business is thereby created for any community. The airlines actually attract the greater portion of the other business transacted on an airport. The very fact that the airlines are using a particular airport possibly brings in more revenue to the community than is derived from all the other airport revenue sources combined. Airlines create jobs and jobs are filled by people in the community who spend their wages right in the city for the greater part. Not only are jobs created, but just as the airport is the medium of the community whereby trade is fostered, so are the airlines such a medium. The airlines and the airport are interrelated in this respect. Because a community enjoys airline service it will also enjoy greater possibilities for prosperity. The community will be able to grow and develop, becoming a link in the national transportation system. On the other hand, the lack of such air service will do a lot to retard a city's growth.

It is not advocated that airlines not be expected to bear their fair share of the costs of maintaining and operating airports. But it is advocated that in arriving at any schedule of charges for airport services that the intangible "increments" be considered as well as the ones that appear on the surface.

Unfortunately, too many municipalities are under the impression that the only real justification for an airport is to have it used by the airlines. This is wrong. Even though the airlines are important they still cannot afford to pay their full way on the airports that may be provided for their use. The private or non-scheduled flier must not, therefore, be forgotten as he provides a fertile source of direct as well as intangible income to any community.

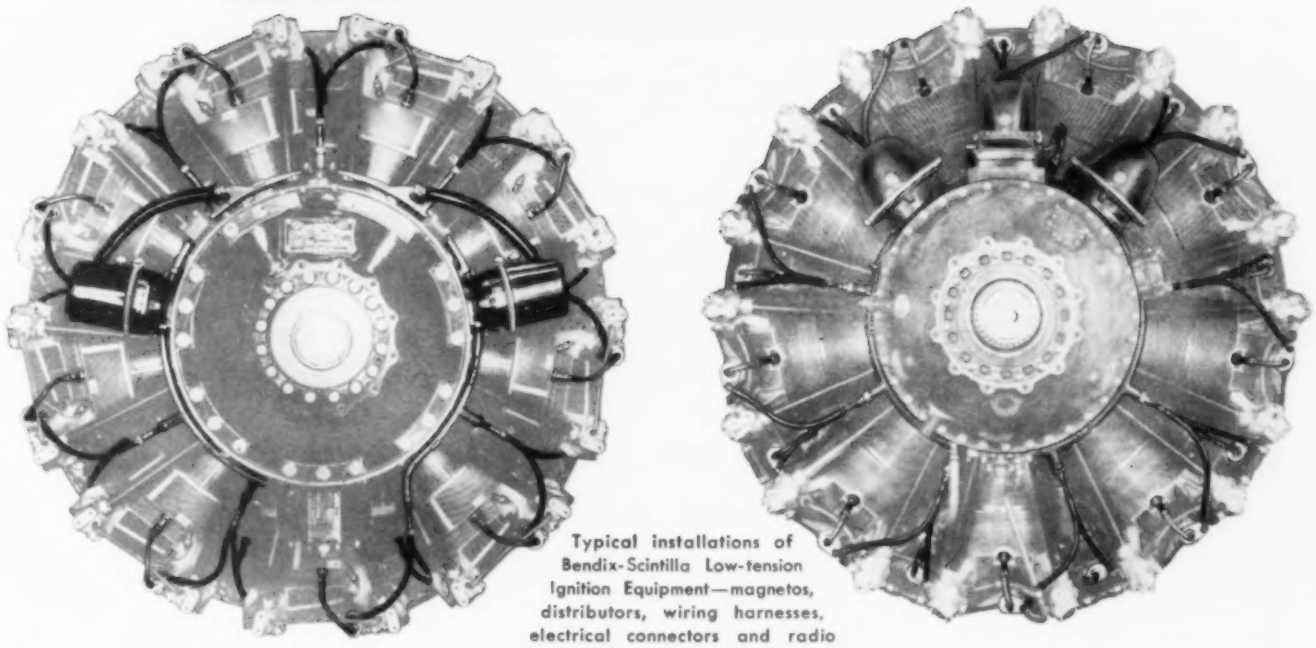
Airport Community Centers

Recently there has been considerable attention given to the idea of residential building on land adjacent to an airport probably owned by the airport developers. As yet, however, there are only two airports in the country having such a development, Washington National and the Lockheed Air Terminal at Burbank, Calif. The possibilities of such an idea are, however, considerable. The airport itself realizes a threefold benefit from development of community activities adjacent to it: 1. The airport will receive

On Nearly Every Mile of Transport Flight...

BENDIX-SCINTILLA

IGNITION EQUIPMENT



Typical installations of Bendix-Scintilla Low-tension Ignition Equipment—magnetos, distributors, wiring harnesses, electrical connectors and radio filters—on recent and leading engines.

Clear-cut superiority has won for Bendix-Scintilla* Ignition Equipment a place on virtually every commercial transport in use in America. Mile after mile, air-hour after hour has proven and reproven the quality of Bendix-Scintilla Ignition products—in use on *every* airline, and specified by *every* major engine manufacturer. Bendix-Scintilla builds both high-tension and low-tension aircraft ignition systems. The newly developed low-tension systems are designed for extra efficiency, especially at higher altitudes. Write for the new brochure, fully illustrating and describing the low-tension system with its outstanding features.

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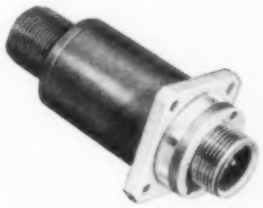

Bendix-Scintilla Radio Interference Filters are designed for insertion in aircraft ignition grounding circuits. Extremely successful in eliminating radio noise at very high frequencies.

Bendix-Scintilla is also a leader in the field of Diesel Fuel Injection Equipment, and it is in wide use on railroad, marine and stationary Diesel engines.

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SIDNEY, N. Y.

Bendix AVIATION CORPORATION

direct revenues from the residents of the community because such people will patronize the various facilities on the airport. 2. The airport will realize an "increment" by setting aside certain areas in the community development for commercial sites which can be leased to business establishments to serve the needs of the residential area. The revenue in this particular case cannot be classified as strictly airport operation revenue. It is an "increment" because it was not realized as the result of the operations of the airport itself. It is income received from something outside airport operation. 3. The surplus property, other than that set aside for commercial sites, can be subdivided into lots and sold as residential areas; the sale of such areas might well cover a substantial part of the construction costs of the airport proper. Income in this case is also an "increment" since it was not realized from airport operation as such.

The ideas just presented are somewhat revolutionary in the field of airport construction, but it is just such new ideas that will build up the aviation industry to the point it should attain. Such development is worthy of note by airports about to be constructed, particularly if they have land available adjacent to their proposed sites. The direct revenue received after the airport goes into operation, as well as the money received from rentals and leases, will play a big part in making the airport a self-supporting enterprise.

It should be pointed out, however, that real estate developments adjacent to airports will probably require private capital back of the airport itself since municipalities do not have the background or the facilities allowing them to think in terms of such a development or even in terms of self-supporting airports. It will take a lot of educational effort to bring the latter type of thinking about.

It might be well to mention several problems which may arise in connection with the type of development under discussion. They can be taken care of or avoided entirely if the airport exercises the proper precautions. Of course, the airport proper will be laid out in such a manner that flying over the residential area will be held to a minimum, particularly as regards landings and take-offs. However, various restrictions as to air space rights and zoning considerations with regard to the height of buildings and obstructions in the community will have to be worked out. Other releases such as those forbidding enjoinment by the community against the airport carrying on its logical operations should also be taken care of. ★ ★ ★

52 Profitable Airports

More revenue than expenditures at 52 cities with populations over 10,000 has been reported in a survey by the International City Managers' Association. Larger cities in the group included Dallas (Love Field), Fort Worth (Meacham Field), Houston Municipal, Fort Wayne (Baer Field), Ind., Indianapolis, Oakland, Calif., and Cincinnati (Lunken Field).

Airmen's Calendar

Sept. 15-17—Air Force Association Convention, Columbus, Ohio.

Sept. 16-18—Second Region CAA operators conference, Atlanta, Ga.

Sept. 19-21 — New Orleans Young Men's Business Club's 1947 Louisiana Goodwill Air Tour to 20 cities in state.

Oct. 3-4—Arizona State Aviation conference, Douglas.

Oct. 24-26—Air Day in Texas, Harlingen, Texas.

Oct. 26-28—National Association of State Aviation officials, Ft. Worth, Tex.

Nov. 4-7—National Airport Show and Institute, Cleveland, Ohio.

Nov. 19-22—5th Annual National Aviation Clinic, Illinois state capitol, Springfield, Ill.

Snow Remover Uses Hot Air on Runways

A revolutionary new snow removing machine, which utilizes a high-output air heater to melt runway snow and ice, has been announced in a brochure available from Snow King Manufacturing Corp., Pittsburgh, Pa. It is claimed to remove, and keep removed, 1,200 cu. yds. an hour at less than 1 cent per cu. yd.

La Guardia Traffic Explained Over PA System to Visitors

La Guardia Airport operations are being described for observation deck visitors over a public address system on Saturdays, Sundays and holidays between 3 and 7 p. m. Victor H. Barden, the announcer, is a former control tower chief familiar with all traffic.

Air Cargo, Inc., Opens First Consolidated Terminal

Operations began August 1 at the nation's first consolidated air freight terminal for scheduled airline shipments at Detroit's Willow Run Airport. The terminal, operated by Air Cargo, Inc., as the agent of 17 airlines, has 5,000 sq. ft. of space in one of the hangars. Similar Air Cargo terminals are scheduled for other key cities.

New Marker Approved

CAA approval has been announced by American Gas Accumulator Co., of Elizabeth, N. J., on its new stake-mounted airport marker light.

Only 309 New Airports in Revised National Airport Program for 1947-48

Announcement of the revised Federal-aid airport program combining the fiscal years 1947 and 1948 reveals that out of 896 projects within the continental United States for which Federal funds will be provided, only 309 will be new airports, the remainder involving only the improvement of existing fields. Most of the projects will involve class 1, 2 and 3 airports.

The report reveals further that the majority of new airport construction will be concentrated in the South and West, what with 131 new fields planned for 16 western states, 112 for 15 southern and southwestern states, and 66 for 17 eastern states and the District of Columbia.

While the eastern states lag behind in the number of new airports, they will receive the largest share both of the total Federal appropriations ($26,936,399) and of Federal appropriations for new airports ($7,828,433). On the appropriation side, the South and Southwest rank second with a total Federal appropriation of $19,102,469 of which $5,549,029 is for new airports, and the West brings up the rear with $18,777,247 and $4,443,949 respectively.

The total Federal expenditure under the revised program will comprise $49,997,985 of the $52,572,750 apportioned among the states as provided in the Federal Airport Act, plus $14,818,530 from the discretionary fund, and $1,753,075 from funds apportioned to Alaska, Hawaii and Puerto Rico. Of this amount $17,821,411 will go toward the construction of new airports within the continental United States.

On an individual state basis, Texas leads in number of new airports for which Federal funds will be provided, with 36. Idaho is second with 20, followed by Missouri and Oklahoma with 14 each, California and North Dakota with 13 each, Michigan and Nebraska with 12 each, Kansas and Montana with 11 apiece, and Washington with 10.

Illinois will receive the largest total Federal appropriation ($5,092,047), followed by New York ($4,803,025), California ($4,425,999), Texas ($3,747,201), and Pennsylvania ($3,723,507). Largest Federal expenditure for new airports will be in New York ($2,056,025), followed by Illinois ($1,617,647, Texas ($1,123,488), Nevada ($1,021,347) and Pennsylvania ($753,703).

In announcing approval of the revised program, the Civil Aeronautics Administration stated that of the 896 projects approved, 725 are for the construction and improvement of Class 1, 2 and 3 airports, and 171 for Class 4 or larger, with only three projects involving the construction of new Class 4 or larger airports.

Anchor Landing Device

By DONALD B. DOOLITTLE
Research Engineer
All American Aviation, Inc.

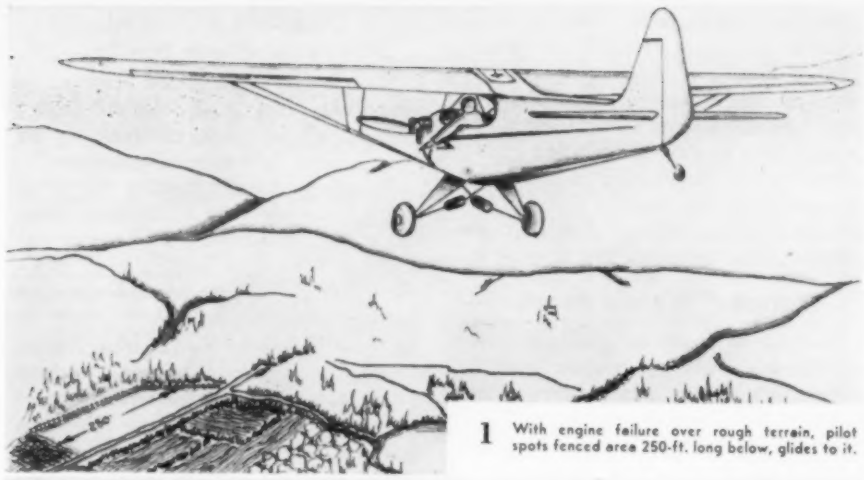
SINCE the beginning of heavier-than-air flight, conventional fixed-wing aircraft have been limited in utility and safety by their inability to land in small, unprepared fields. Even with flaps, tricycle landing gear and good wheel brakes, there are still many accidents due to overshooting runways and emergency landings in fields of insufficient length or poor surface conditions.

Complicated, expensive, and heavy arresting systems obviously cannot be located at each point where an aircraft might have to make either a routine or an emergency landing. To have an arresting gear which would be of practical use to any land-based aircraft, either civilian or military, it would be necessary that the system be carried within the aircraft and that it be possible to secure ground anchorage at any desired point.

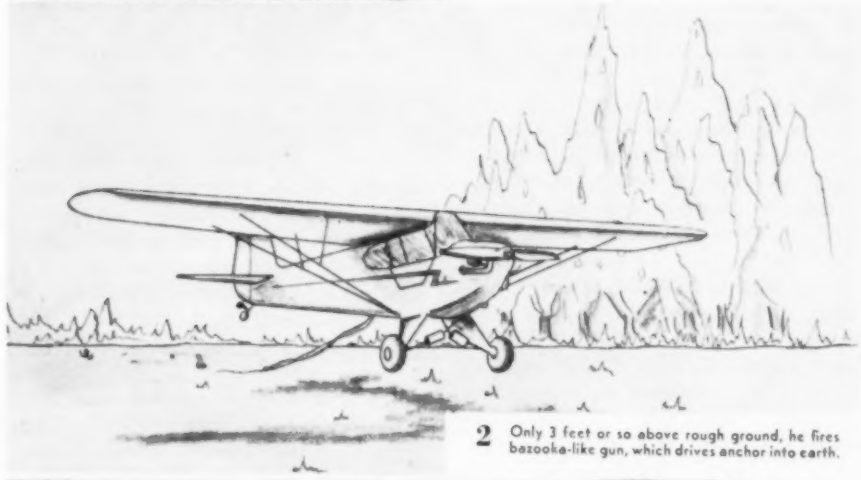
Approved on Cub

An arresting gear which accomplishes these objectives has been developed by All American Aviation, Inc. and Civil Aeronautics Administration approval has been obtained for such installation in the Piper J3 Cub. With the addition of only 21 pounds to the airplane, the Cub may now be equipped with an arresting gear which will make possible landings with a *ground roll of only fifteen or twenty feet*, and with which, during tests, landings have been made with *no forward roll* after the wheels touch the ground.

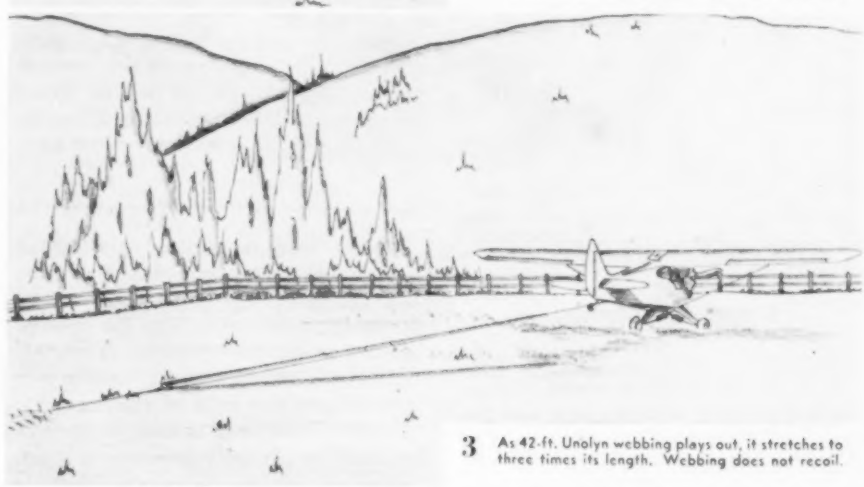
This contribution to flying safety has been made possible by a remarkable synthetic fiber called Unolyn. Developed from undrawn nylon by All American Aviation, this fiber will stretch like taffy to several times its original length at an almost-uniform load. A piece of webbing three inches wide and about one-eighth-inch thick will elongate under a load of approximately 1,200 pounds to three times



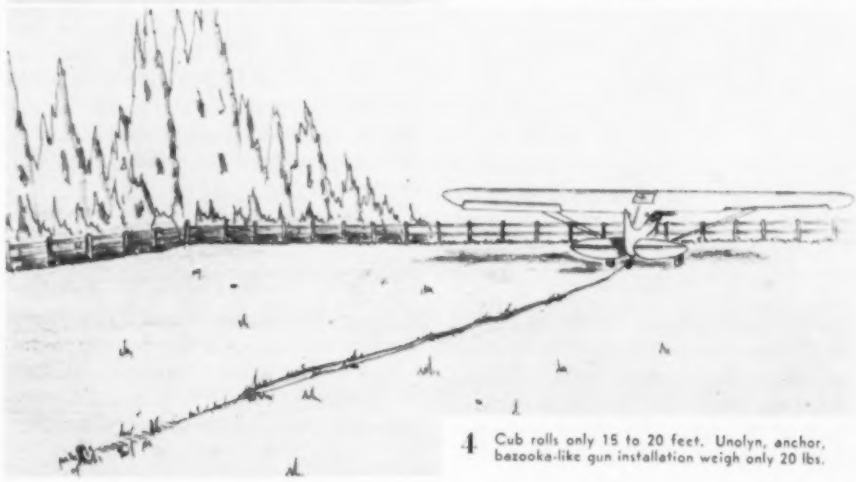
1 With engine failure over rough terrain, pilot spots fenced area 250-ft. long below, glides to it.



2 Only 3 feet or so above rough ground, he fires bazooka-like gun, which drives anchor into earth.



3 As 42-ft. Unolyn webbing plays out, it stretches to three times its length. Webbing does not recoil.



4 Cub rolls only 15 to 20 feet. Unolyn, anchor, bazooka-like gun installation weigh only 20 lbs.

its original length, after which it will attain a breaking strength of about 1,800 pounds. A 42-foot length of this webbing is capable of stopping a 1,200 pound airplane from a speed of 80 mph. at a rate of deceleration comparable to full application of automobile brakes on dry concrete. This is considerably less violent than that of aircraft carrier arresting gears.

"Bazooka" Without Recoil

In order to form an anchorage for this Unolyn webbing, the airplane is equipped with an explosively-driven "anchor" fired into the ground at high velocity from a bazooka-type launching tube mounted behind the rear seat. The anchor can be driven with the wheels as much as three feet off the ground. This anchor consists of a length of steel tubing with a steel point in one end and a cable attachment lug about one-fourth of the tube length up from the point. A charge of shotgun powder and an electric firing squib are loaded in the point end of this anchor and the remaining part of the tube is filled with lead shot ballast. When the electric squib is fired by the pilot, the lead shot is blown harmlessly into the air, behind the airplane, absorbing all recoil, and the anchor tube with a steel cable attached is driven into the ground to form an anchoring point for the arrest.

The steel cable, in turn, is attached to the Unolyn webbing, which is packed back and forth in ribbon candy fashion in a moisture-proofed cardboard box. As the airplane proceeds beyond the point of firing, the Unolyn webbing is pulled from the box, and when all the slack has been taken up, the webbing begins to stretch rapidly, bringing the airplane to a smooth stop.

Simple Installation

The installation of the arresting gear in Cub aircraft is very simple. It is attached entirely with clamps, and no structural alterations to the airplane are necessary. All major parts of the installation are inside the airplane. No additional drag, therefore, is caused by the installation. A steel launching tube, which holds the anchor in proper position for firing, and which retains the shot until it leaves the airplane, is mounted behind the rear seat and runs from the top to the bottom of the fuselage. An aluminum box at the lower end of this tube holds the steel cable and the Unolyn in proper position. The Unolyn is attached to the airplane by means of a static cable which runs back through a guide clamped to the longeron at the lifting handle and from there inside the fuselage to a lug attached to the rear landing gear fitting. In this manner, the arresting load is applied to a strong point in the structure of the airplane and the point where the cable finally leaves the airplane is kept far enough aft to prevent nosing over. A control box containing the firing battery is located over the head of the occupant of the front seat where it can be reached by either pilot or passenger. As a precaution, a guarded arming switch is provided in addition to the firing switch. To fire the arresting gear, the arming switch must be moved to "armed" position before the firing switch is closed. A test light is also provided to check the condition of the batteries.

It is expected that this arresting gear will soon be adapted to other light private aircraft such as the Aeronca, Stinson 150, Globe Swift, Bellanca Cruisair, etc. For faster and more aerodynamically - refined airplanes which have a greater tendency to float on landings, the gear will be even more valuable than for the slower Cub.

★ ★ ★

DESIGN REVIVAL

(Continued from page 18)

85 Continental. He is now engaged in modifying it as a semi-tailless (short tail and all-moveable surfaces) as an experimental commercial prototype.

Naugle personally doubts the value of the Goodyear's short (2-mile) pylon course in contributing to commercial designs. "I have in mind a race, however, that did do considerable good in Europe some fifteen years ago," he writes. "This was the Europa Rundflug, or 'Around Europe' contest which developed such outstanding designs as the Messerschmitt 108—undoubtedly the best 4-place airplane ever built, which has been in production ever since 1932 except for the war. It was the forerunner of the Me-109."

Naugle suggests an "Around America" competition for lightplanes. But, getting back to the European idea, he continues: "The Europa Rundflug started with a ground inspection wherein a certain number of points were given for obvious design features —folding wings, number of seats, engine power, retractable gear, baggage accommodations and the like. The planes then went through a flight-test program which gave so many points for low landing speed, take-off over obstacles, rate of climb and such. They next were flown on a 5,000-mile tour of Europe and North Africa, where cross-country characteristics were checked. On returning to the starting point, they engaged in a free-for-all race around a 50-mile course. Then the points were all added and the winner decided.

"Such a contest actually developed new airplanes which were practical for production; the Cleveland race doesn't. The manufacturers entered this race; only individuals enter planes at Cleveland. It is important to get the industry back on its feet—the individual exploits of contestants at Cleveland can't do that.

"I would like to see such a contest organized in this country. Something like it could put the industry and private flying back on a paying basis. A course from New York to Los Angeles would test completely the value of the contesting models for practical cross-country operations—what else is a private airplane good for? If it's just for airport flying we may as well quit right now.

"The prizes would have to be sufficient to allow the competing companies to write off a reasonable part of the experimental cost. Then they would have a demonstrably worthwhile airplane and a product to sell.

"I would even like to see such a contest subsidized by the government—in contrast to money spent on research. NACA wartime research is absolutely no good to anyone until it is adapted to actual production models. But what good is research if we don't use it? We shall not have a worthwhile personal plane industry until this information is studied, digested and applied to specific designs, including designs which are new even in concept. The most important reason for the present slump in private flying and manufacturing is the obvious fact that most of the planes being offered to the public are fifth-rate affairs based on 1930 design information. We have by no means seen a truly 'postwar' airplane as yet.

"As for the Around America competition, I'd like to see someone start to beat the drums for such a contest. Let the boys work on their designs this Fall and have something for next Summer. Spoilers and 'feelerons'? Hell, they had them on the 4-place Me-108 fifteen years ago. This plane had full span slots and flaps, a top speed of 190 mph., and a minimum flying speed of 39 mph."

As we prepare to leave for Cleveland and the midgets, we think Brother Naugle has something, especially regarding competition on cross-country for 4-place aircraft. We also agree with his slant on the 1930 designs now being offered (but we think Beech's Bonanza is definitely postwar and the most significant advancement in lightplane design in years). Goodyear put up $25,000 for the midgets. Who'll offer $100,000 or so for an Around America competition for 4-placers?

★ ★ ★

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Soaring Offers Possibilities

WE attended the National Soaring Meet at Wichita Falls. In spite of our connection with aviation for a good many years, it was the first time we had ever been to a soaring meet. We can tell you it was thrilling and eye-opening.

Wichita Falls is the approximate center of an area which has more up-drafts than any other place in the world. That is probably because there is quite a collection of Texans and oil men there and the hot air that is produced at any point where these people gather is enough to lift any number of gliders many thousands of feet.

Many records were broken; the only thing we didn't like was a man on the public address system the final day. He constantly harrassed the audience by ordering a few people to get away from the planes and stand back so far that they couldn't see anything.

It is about time people learned that in order to make functions attractive to the general public, they have to be as courteous as humanly possible, ever careful not to do anything that would upset the fare-paying public.

Anyway, we saw a galaxy of sailplanes both on the ground and in the air, and they did a lot of amazing things. It seemed that some of them could stay up forever and could climb to record-breaking altitudes. Our pal, George Haddaway, editor of this magazine, succeeded in getting a ride to 10,000 feet, but nobody offered us one, and in view of the fact that one of our feet has always been pretty well embedded in the ground, we couldn't go around soliciting one. After all, those things look pretty frail and every landing is a forced landing. Being an old single-engine, mountain-flying pilot, these forced landings without an engine have never seemed attractive to us.

On occasion we have done a little soaring in conventional airplanes when we could point the nose practically straight down at half throttle and still gain altitude. On one occasion when we were flying from Jacksonville to Miami, Florida, we found a spot about a hundred yards in from the beach where we got a continuous up-draft all the way down the coast and were able to throttle back, put the nose down, and gain ten or fifteen miles an hour and not lose any altitude. There ought to be more of those built-in up-drafts to help some of our modern airplanes over the hump sometimes.

I think that there is no doubt that sailplanes have contributed a good deal to aviation. In Germany, where the only mass sailplane flying has been done, they succeeded in building an air force from sailplane pilots. In general it appears to be as safe as any other type of flying, and unless you go in for the super duper models, it appears to be very much cheaper than anything else. In Gainesville, Texas, we have seen sailplanes towed off the ground by automobiles and at other places we have seen them yanked off by winch tow. It would not be expensive for any flying club or group to get one or more sailplanes and launching mechanisms, and have an enormous amount of fun, especially where good thermal conditions exist.

Cessna vs. Airline

In the last two months we have made two automobile trips to California and three DC-4 flights to California. We have also flown twice to New York on the airlines and once in our own plane.

The comparison between automobiles and airplanes, especially the airlines, is so entirely in favor of the airlines it isn't even funny. It took us three of the hardest days' driving we have ever done, in sweltering, desert heat, to get to California in the car. We had a number of punctures or blowouts with new tires. This, in the sweltering heat of the desert, is no fun. But on the airline we made the trips in from five hours and fifteen minutes to six hours and thirty minutes elapsed time. At no time were we hot, except when we took off from Dallas, and sometimes we were even cold. The only gripe we have against the airlines is the lousy meals that most of them have started serving in the last few months. In spite of the fact that all the ingredients for putting out decent meals are more available now than at any time during the war, the service seems to have gone downhill. We were terribly griped the other morning to get on one of the biggest and best airlines in the world at 4:40 and find ourselves served about 7:30 with two strips of bacon and a couple of cinnamon rolls. Bacon without eggs has always been useless to us unless it was in a bacon and tomato sandwich and even those we usually passed up. A few airlines continue to serve delicious bacon and scrambled eggs for breakfast and we haven't seen many people passing them up.

We had been making trips on the airline with the thought that it was cheaper than going in our own twin-engine Cessna. However, the other day we had two people to take along with us, and a rapid calculation showed that we probably would save in excess of three hundred dollars by flying the Cessna to New York as compared to the three of us buying round-trip airline tickets. As a matter of fact, after getting back and checking over the entire expenses and allowing a reasonable amount for depreciation (at the rates you can buy twin-engine Cessnas now, the depreciation doesn't amount to much), we found that the actual saving of three going in the Cessna was $312. Bear in mind that a round trip airline ticket to New York runs around $170. In addition, we had no worries as to meeting a schedule either going or coming. We did have one worry and that was whether we would get there in time to save our hotel reservation. However, it is easier to postpone a reservation than it is to get one in the first place.

We had no difficulties with the Cessna and made airline time. Of course the Cessna cannot compete with the DC-4 or the DC-6 non-stops, but it does pretty well compared with any of the milk runs. We believe that a good many people have necessity of air transportation of their own and it would pay off if they only knew how to go about it.

Postwar Probes

It appears now that some of the chickens hatched out during the war are coming home to roost and with somewhat disastrous consequences.

The recent episode in Congress with regard to the inquiry of the Howard Hughes' contracts, unless politics shuts it up quickly, will probably develop into a wholesale expose of some of the methods used during the war.

From our point of view, the worst thing about this whole business is the methods used and consequences to many innocent individuals.

Early in the war there was a horse barn situated on a farm in which a few fellows had succeeded in putting together a fairly conventional two-place airplane that they had interested the owner of the horse barn in financing. This made the owner of the horse barn believe that he was capable of manufacturing airplanes during the war, so he went to Washington and obtained a terrific sum of money with which he built on his pasture an aircraft factory. He put pressure on one of the aircraft companies that had an off-hand airplane which they did not wish to build and which the Army didn't much want, and, as far as we

know, didn't use with any degree of success. At any rate they obtained a contract to build six hundred of these twin engine wooden airplanes. Upon completion of these they obtained a contract to do some repair work on several hundred airplanes of another make and then the war ended.

During the war they were also busy with the design of a small single-engine two-seater airplane, which they proposed to put into production. These people went ahead, spent money, made contracts and other things looking toward the manufacture of from four to six thousand airplanes in one year. With my own company, after a lot of sales talk, they wrote up a contract calling for two thousand sets of parts at a total price of $242,000. From time to time we discussed the possibilities that they would never be able to deliver or sell that many airplanes, whereupon they brought out bales of inquiries and other things in which they had great faith.

During the writing of this contract, this company's attorney made some rather disparaging remarks about my company and insisted on inserting a clause to the effect that in the event my company went bankrupt protection would accrue to their company. But, I suggested, what could we do in event they went bankrupt? This evoked a sardonic snicker from the young attorney.

As it happens, this horse barn airplane plant suddenly folded its wings, closed its doors and left underwriters holding the sack for more than a million dollars, the RFC holding the sack for several hundred thousand dollars, and other creditors such as ourselves holding the bag to the tune of about a million and a half or two million dollars.

This makes us look with skepticism on a lot of these people who engage in technical business without having any considerable experience or success in the past. We wonder just how many people all over the country will be hurt by people of this category.

The other day we were in Los Angeles at a meeting of one of the Government commissions, and discovered that, of the various manufacturers present, only two or three had any long experience dating back before the war. All of the rest of them had started up during the war, or since the war and had gotten into fairly competitive businesses where they were each running after the limited amount of business available.

Dissipated Purchasing Power

We read in the Wall Street Journal where Mr. Morris, the founder of the Morris Plan Bank System, had made the prediction that we would enjoy a considerable business relapse, not of panic proportions, but nevertheless a considerable depression, starting in early 1948. This he attributed to the fact that people were purchasing more and more higher-priced materials and equipment, frequently at prices greatly inflated. He said that this produced a spiral of inflation and that it would dissipate faster and faster the country's spending power, which inevitably results in a depression.

The depression and crash of 1929 and subsequent years came about not by virtue of a wild spending spree, but by virtue of tremendously increased productive facilities, which in the summer of 1929 resulted in great overstocks in almost every commodity. Naturally a dumping process followed in which people took losses in order to recover their investment. These losses were reflected in corporation earnings or anticipated earnings and as a result everybody in the investing business put his money in a can under the hearthstone or in the bank or in his safety deposit box.

In this particular case, we do not have as yet any over-production in any important lines. Refrigerators, automobiles, building materials, freight cars, radios, etc., are still on the short list and promise to be for many months. Our main fear at this time is not from over-production, but that people will spend themselves out of money, and regardless of the availability or the scarcity of commodities, simply will not have purchasing power. Thus it may be a race between spiraling paychecks and spiraling costs. If an unbalance ever obtains in favor of increased cost, then purchasing power will drop off at an alarming rate. As the usual thing, cost goes up before salaries do, at least living costs usually do. Thus the requirement for additional money for living expenses usually reduces the purchasing power of the country before other adjustments are made.

To our notion there is one sound economic policy and that is to increase production and lower costs. In this way purchasing power is always ahead of production and saturation of the market is the only fear we would have. The saturation point can be staved off for many years if we properly develop the export markets. That goes especially for aviation.

Loss of purchasing power has been one of the worst ailments of the private plane business. We know many people who want their own planes. But costs have dissipated their purchasing power, in most cases to below zero. By and large, from our own personal observation, these high costs were precipitated by labor, first, in making the demands for war-size take-home pay, with lower hours and production, and second, by the black market and other influences resulting from the OPA and other government controls on business. Certain business men helped it all along, too, by wanting to live high while the getting was good. Maybe the depression will shake us out and get us back to our senses, with aviation emerging from its present dilemma into a stronger and more profitable enterprise. ★ ★ ★

AIR REPORT

(Continued from page 5)

Improvement Seen in Aviation Statistics

The Budget Bureau's advisory committee on aviation statistics, appointed last January, is developing a comprehensive plan for improvement in the collection, compilation and publication of such statistics. With more than a score of Federal departments and agencies collecting and sometimes publishing statistics and information which interest them exclusively, the Budget Bureau committee now realizes that a complete overhaul of present procedures will be necessary to produce accurate, timely and useful aviation statistics. Recognition of the fact that the CAA-CAB problem is a budgetary one as well as one of reorganization will accomplish more than any other one factor in correcting the present sad situation. Improvement if it comes, however, will not be visible inside eight months to a year.

Air Power Outlook Still Dark

With only 800 new military airplanes for the AAF and some 600 for the Navy covered by appropriations during the last session of Congress, optimism over any immediate effective results from the establishment of a separate air force is unfounded. Skeptical observers commenting on the recommendations of the President's Air Policy Commission recite the failure of Congress to adopt similar recommendations made by equivalent policy boards appointed during the period between World War I and World War II. Meanwhile, complete disintegration of manufacturers' technical and engineering staffs and first-line fighting units of the AAF continues. Likewise, there is no assurance that Congress will do anything about these critical matters when it convenes next January. Far too many of the citizenry look upon unification of the armed services as a cure-all. In actuality, it is purely an administrative and organizational evolution.

Short Snorts

C. G. Taylor's revived manufacturing firm is readying a new 4-place T-Craft, but won't discuss details, and an 85-hp. 2-placer. . . . Lockheed, reported by SOUTHERN FLIGHT in July to be working on Saturn No. 2 with 850-hp. Wright engines, may soon revive the project for feeder airlines. No. 2 has now been test-flown.

A Coast distributor is reported to be organizing a new firm which would obtain an NC for and manufacture Weatherly-Campbell Aircraft Company's 4-place, all-metal, 190-mph. Colt, built in Dallas. . . . Misha Kantor, formerly with Luscombe and designer of its single-seater, now has his own design near completion on the Bridgeport, Conn., Municipal Airport —an all-metal 4-place low-wing.

THE REVOLUTIONARY

Not until you sit in the new four-place Silvaire Sedan will you know how roomy and comfortable a personal plane can be. And not until you have flown the Silvaire Sedan will you appreciate the easy handling, maneuverability and maximum visibility found only in this most modern all-metal plane.

The Silvaire Sedan is not an adaptation of a war-born airplane. It is designed from "scratch" to meet the engineering requirements of a truly new four-place personal plane with the greatest utility and comfort.

Here are but a few of the salient features a Silvaire Sedan offers . . . details never before found in one plane! *Utility* . . . Carries four passengers, full gas load, 100 lbs. of baggage with ease; or, with seats removed, 600 lbs. or more of cargo in more than 55 cubic feet of cargo space . . . *Small Field Adaptability* . . . Quick take-off and fast rate of climb with a 165-horsepower engine; Cruising range of more than 500 miles at approximately 130 miles per hour, low landing speed, and sturdy, flexible full-cantilever landing gear making almost any field or pasture a landing strip . . . *High Wing Visibility* . . . Plus 3,716 square inches of window area for 'round the clock visibility . . . *And* for low upkeep, lessened depreciation, long life, the durable, strong, all-metal construction, including stressed-skin metal wing, pioneered by Luscombe in the popular-priced personal plane field. "Planely" speaking Luscombe leads in value and utility with the new *Silvaire Sedan.*

Plenty of roomy comfort for the family in the unusually wide seats, and lots of head and leg room. And, there's 'round the clock visibility with overhead and rear windows and *more window area than the average low-priced car.*

Be one of the first to enjoy the true utility of a new Silvaire Sedan. You can get priority on delivery by making a token deposit now with your authorized Luscombe Dealer. Deposit on priority certificate will be refunded at any time upon request. Write Department 11 for details.

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AIRPLANE CORPORATION

DALLAS, TEXAS

Lightplane Refinishing

Outlining the essential steps in performing an effective job, with suggestions for avoiding troublesome complications.

By THEODORE A. J. WARD
President, Titanine, Inc.

THE first thing to consider in refinishing a lightplane is what portions need a complete new covering and what portions may be refinished without recovering. Usually it will be found cheaper to recover top wing surfaces, the fin and all control surfaces including stabilizers. Under surfaces and possibly the fuselage will need only rejuvenating and repainting.

Initial Preparations

It is a messy and costly process to remove the color coats and it may well be confined to the metal cowlings and trim. This removal should be done with a wax-free remover and all cleaned metal washed with either stripping thinner or dope solvent. It should immediately be primed with zinc chromate primer.

All portions to be recovered should have the old fabric completely stripped. The metal framing should be cleaned with dope thinner, re-primed and allowed to dry thoroughly. Meanwhile, those fabric surfaces to be refinished but not recovered should be carefully sanded, using wet-or-dry sandpaper and plenty of soapy water, until all decomposed dope is removed. They should then be washed clean with water and thoroughly dried.

Where edges abut old fabric, the pigmented dope on the old fabric must be softened with stripping thinner and the pigmented dope scraped off sufficiently far back to allow the tape to be applied to clear dopes only.

Doping Fabric

The fresh covers can now be applied to those surfaces requiring them, sewn in place and given a first coat of dope by brush. When dry, all lacing must be covered, and new fabric faired to retained old fabric, preferably with predoped tape.

The surfaces to be taped must receive a full wet coat of dope thinned about 60 per cent of dope to 40 per cent thinner and the tape pressed down into the wet dope, predoped side downwards. When dry, two full coats of clear dope should be applied over the whole surface, either by brush or spray, allowing one hour between coats and overnight drying.

Any cracked spots in the old fabric should have rejuvenator well worked in and allowed to dry. The fabric surfaces which are not to be recovered may now receive their heavy sprayed coat of rejuvenator and allowed to dry overnight.

The final coat of clear dope should now be sprayed over the new work. Using a mixture of about 70 of dope to 30 of thinner, with anti-blush as part of the thinner if necessary, a full uniform coating should be applied.

Aluminum undercoating should now be prepared by thoroughly incorporating one pound of aluminum dope with a gallon of thinner and mixing into this five gallons of clear dope. The resulting mixture should be thinned with a gallon of anti-blush and the whole surface sprayed with a full, even cross-coat.

When this is thoroughly dry and the surface tight, wet sanding should be carried out with 320 wet-or-dry paper and plenty of soapy water, care being taken that the dope is not cut away over lacing and that no thin spots are worn along the edges of fairing strips. Any such thin spots will later give cracking and, if accidentally made, should be rebuilt by brush, with the aluminum undercoating material, and again smoothed carefully with sandpaper.

The smoothness of the final finish will depend entirely on the uniform smoothness and fill obtained at this stage of the work. If not satisfied with the fill at this point, repeat the aluminum coat and sanding, but do not attempt to fill later with extra pigmented dope, or the result will be unsatisfactory. If a second coat of aluminum is applied, it must be sanded thoroughly, as a heavy layer of aluminum is undesirable in the final film.

Pigmenting

All surfaces are now in the same condition, ready to receive their pigmented coating. If any of the surface is to be finished with a red that is known to be a bleeder, that portion of the surface must be marked off and left till last. In general, all dark colored portions should be applied after lighter colors such as yellow, cream, or white.

The pigmented dope must be thoroughly stirred and every bit of pigment removed from the cans and worked uniformly into the dope. About half the dope should be poured into the spray tank, then the other half thoroughly worked up and added and the drum or can washed out two or three times with successive small lots of thinner. The final mixture should contain 30 parts thinner to 70 parts dope for pressure tank or 40 parts thinner to 60 parts dope for suction gun.

The first coat of pigmented dope may now be applied to all the fabric surfaces. This should be a light but wet and uniform coat and should soak well into and knit the undercoat. This coat should dry at least an hour.

The second pigmented coat should be a heavy, wet cross-coat and should dry evenly to a bright clean finish without shading.

A third cross-coat, wet but not heavy, will now complete the painting of the fabric. When practically dry, masking may be stripped but the pigmented surface must not be remasked for the trim colors until completely dry, or else the second masking may strip the first color from the undercoat.

The trim color should be built up in the same way as the body color, but the mask should not be removed until the color is quite dry. Any rough edges may then be smoothed by hand very carefully with 400 sandpaper and soapy water, washed clean, dried and the surface appearance restored by carefully spraying a mist coat of retarder along the sanded lines with a hand gun and a fine jet.

Metal Finishing

The treatment of the primed cowling with lacquer may parallel the pigmented dope applications step by step and with identical handling throughout. However, if it is decided to finish the metal with synthetic enamel, this should not be started until the dope work is finished, as dope fumes will soften the synthetic and cause sticking of masks. Detachable metal parts can be finished away from dope fumes, but all fixed trim, etc., must be masked till the dope work is finished.

The synthetic must be applied using the same precautions as to order of colors and under conditions as free from dust as possible. Two single coats will usually be sufficient, applied about 30 minutes apart and allowed to dry for at least an hour before removal of the masks. The first coat should be applied as an extremely thin but wet coat. The heavier coat can follow as soon as the first sets up.

Final Waxing

When thoroughly dry, three or four days later, the whole job may be cleaned down with a non-abrasive polish and given a coat of wax. The result should be a lasting finish comparable in looks with a good automobile. ★ ★ ★

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Resurgence of NATA Reported by Meixell

In a report to members covering the year between August 1946 and August 1947, Harry Meixell, executive director of the National Aviation Trades Association, revealed that the membership has increased from 113 to more than 2,500 and that dues or commitments for dues have increased to nearly $30,000 in comparison with only $10,400 as of last year. Meixell attributed this progress to the reorganization plan inaugurated last year when NATA voted to become a federation of state aviation trades associations. Thirty-one such associations are now affiliated. CAA Region IV, comprising the states of Arkansas, Louisiana, Oklahoma, New Mexico and Texas, does not as yet have any NATA affiliation. An active member at large will soon be chosen to effect organization in that region.

In view of the substantial endorsement given NATA under its reorganization plan with emphasis on the state level groups, Meixell stated that the official publication will be published regularly during the first and third weeks of each month. It will cover important developments affecting fixed-base operators and disseminate news of state chapters.

ADMA Plans Expansion with Dealers, Airports, Schools, Shops as Members

At a recent meeting of the officers, directors and committee chairmen of the Aviation Distributors and Manufacturers Association, A. J. Weatherhead, Jr., ADMA president and president of the Weatherhead Company of Cleveland, recommended a nine-point "Safeway Plan" for the organization. He urged that an associate membership be established to include dealers, airport operators, flying schools and service shops — categories that now comprise the principal membership of the National Aviation Trades Association. He called for a well planned bulletin service containing credit information, legislative and CAA information. Emphasizing the importance of sales promotional activities he recommended a hard-hitting association advertising and publicity program.

On the subject of trade shows he asked for the hotel booth type of show for economy and that one show be held in the East and one in the West. Weatherhead's other recommendations included the publication of an association bulletin or house organ, a manual containing flat rates for parts and service, a map listing service and covering all airports with full details of physical layout and services available, and the creation of a decal identifying distributors belonging to the association.

William D. Wynant of the Parker Appliance Company, chairman of the committee on government surplus, reviewed the difficulties encountered in saving an orderly surplus disposal program for the new Federal fiscal year. The most important problem now is that there is no clear-cut method to scrap material in long supply.

R. D. Hicks, Continental Motors Corporation, chairman of the committee on obsolescence, recommended that manufacturers obtain at least once a year, complete itemized listings of distributors' inventories and use them in a program designed to move overstocked items to other locations where the need for them exists. His committee also recommended that a coded list of all individual service parts, designed to reflect their current usage, be supplied the distributor by the manufacturer. Six classifications ranging from best sellers to obsolete items were included.

COMBINATION TACHOLOG by Kollsman provides cumulative log of engine hours based on 2,000-rpm. cruising speed. Higher speeds are counted faster than below-cruising revs. It fits 3 ½-in. mounting.

NEWS IN BRIEF

August 1 was the deadline for registering planes with the Michigan State Department of Aeronautics for 1947-48 at a fee of one-half cent per pound of net empty weight. Meanwhile, Michigan Department of Aeronautics "patrol planes" started a campaign to track down to their destination all pilots flying low or buzzing. State law prohibits flight less than 500 feet over both terrain and water.

Jim Batchelor, whose aggressive United Pilots & Mechanics Association is rendering more and more new services to members, says he is setting up **a master file on each CAA inspector "to keep tab on their conduct."** Some inspectors are the subject of several complaints over a period of years, he said, but CAA files "never contain any complaints." From now on UPMA will maintain its own files and will be able to cite complaints, without revealing sources, and "thus help CAA cut out the dead wood in its organization under Civil Service rules."

Amendment of the CAR now authorizes flight examiners to issue **permanent type student pilot certificates** instead of the temporary form used until recently. New forms are being issued by CAA.

Local aviation councils, co-ordinating the work of various aviation groups, are being organized in many communities under auspices of the National Aeronautic Association. A stronger voice in local affairs is the goal, without NAA management or fees.

The CAB has adopted a revised Part 60 of the Civil Air Regulations covering air traffic rules. Revisions will become effective October 8 and include rules governing aircraft on surface of water and regulations governing helicopter flying. Many changes were to clarify and simplify existing rules, and some were altered to conform to state and municipal needs, thus forestalling conflicting local regulations.

Lightplane shipments in July by Aircraft Industries Association member companies, totalling 991 compared with 1,145 for June and bringing the January-July total to 11,695, were as follows: Aeronca—36 Super Chiefs, 27 Champions, 3 Chiefs and 3 Scouts; Beech—155 Bonanzas; Bellanca—15 Cruisairs; Cessna—46 120's and 52 140's; Erco—51 Ercoupes; Luscombe—110 Silvaires; North American—40 Navions; Piper—72 Cub Specials, 43 Super Cruisers, 57 Cub Trainers; Republic — 21 Seabees; Stinson — 230 Voyagers; Taylorcraft—13 T-Crafts; Temco—17 Swifts.

Following a two-year test period in the Los Angeles area during which more than two thousand courses have been sold, **National Flight System, Hollywood, has announced the election of Dick Powell, movie star, as president, and the formation of an ambitious plan to enroll one million new pilots a year on a nation-wide basis.**

The NFS program calls for setting up an organization of 400 distributors throughout the country to sell a special "flight package" consisting of eight hours of dual instruction, a six-month correspondence ground-school course, and membership in National Flight System, which entitles the member to a 15 per cent discount on airplane rentals, liberalized cross-country privileges, and a plane purchaser's service—all for a period of three years. The entire package sells for $245 and can be paid at $15 per month, according to Powell, who outlined the details in answering an inquiry made by SOUTHERN FLIGHT.

National Flight System will be a strictly sales organization, and will operate no flying schools of its own, this phase of the activity being handled by established local operators on a contract basis, with the operator paying NFS a commission (15 per cent on each student) based on the volume of business sent him. Definite standards will be set by NFS for such authorized operators, and distributors will make constant checks on the quali-

ty of flight instruction offered. In addition, regional supervisors will be charged with inspection of flight schools over and above their sales supervision duties.

NFS distributors as opposed to authorized flight schools will be selected on a basis of sales background and financial responsibility. A minimum capital of $5,000 will be required.

NFS states that it is now forming an organization of 400 distributors which it will service with advertising, sales promotion, publicity, bookkeeping and other business aids, and that when the organization is complete it intends to spend approximately $250,000 a month on the promotion of private flying.

OPERATIONS

Among conversions at Sky-Travel, Inc., Houston Municipal Airport operation, is a **DC-4 to be used in flying cattle from Texas to Guatemala.** N. N. Fulkerson, CAA aircraft inspector following Navy and Beech and Boeing aircraft inspection and survey work, has been named superintendent of shops in charge of aircraft maintenance and service at Sky-Travel.

A new hangar has been completed by Aero Corporation, major overhaul and maintenance operation, at Chandler Field, Atlanta, Ga. Its outstanding feature is a **radiant heating system concealed in the concrete floor.** The buried system consists of seven panels fabricated of more than a mile of 2-in. wrought iron pipe. Hot water is circulated through it at 140 degrees to provide a floor temperature of 85 degrees. Aero Corp. plans a 3-story office building in addition to the 120 by 120-ft. hangar.

An NL Approved Type Certificate for a North American BC-1 (basic combat), believed to be the first on that model, has been issued to Mustang Aviation, Love Field, Dallas. John Surratt said the BC-1, with 650-hp. Pratt & Whitney and similar to AT-6, was modified as a smoke writer. Mustang has also received authority to test new or modified aircraft radio installations without licensing each job —as long as the aircraft remains under their control.

Pacific Airmotive Corp., has established an Atlantic Division with headquarters at Linden, N. J., in charge of Gunnar Edenquist, vice president. Tenth PAC base, it extends the firm's operation from coast to coast. Other bases are at Burbank, Seattle, Anchorage, Oakland, Fresno, Glendale, San Diego, Phoenix, and Kansas City. PAC is reported to be planning an eleventh base in the Southwest at Dallas, Houston or New Orleans but has not commented on such reports.

A School of Aeronautics has been established at Love Field, Dallas, by Southwest Airmotive, with 1-year

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For cross-country flight operation A.R.C. offers the R-11A Range Receiver, which with the L-10 Loop, C-16 and C-18 Control Units and A-12 Antenna provides a dependable, compact communication receiver and navigation instrument.

The loop attachment is ideal for direction finding and homing, while the receiver, with special A.R.C. noise-suppressing circuitry, gives new clarity and strength of reception over distances up to 250 miles. If no loop operation is contemplated, the R-11 Receiver is available at a lower cost.

The system described above meets basic communication and navigation needs for cross-country flying. Other A.R.C. units may be added as required, to make possible VHF Reception and Transmission, and to use the Omni-Directional and Visual-Aural Ranges now being installed by the CAA on a country-wide basis. For full information on A.R.C. units and systems, see your Authorized A.R.C. Distributor, or write direct.

SPECIFICATIONS A.R.C. RECEIVER TYPE R-11A

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TUNING ACCURACY
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SENSITIVITY
2 microvolts or better throughout the band.

SELECTIVITY
Signal 30 db. down at 3 KC off resonance, and 60 db. down at 5 KC off resonance.

AUDIO OUTPUT
Over 500 milliwatts into 300 ohms load. (Two headsets.)

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Baker-Eberle Aviation Corp., Detroit, Michigan
Buffalo Aeronautical Corp., Buffalo, New York
Aeronautical Electronics, Inc., Raleigh, North Carolina
Servaire Corp. of New England, Norwood, Massachusetts
Southwest Airmotive Co., Dallas, Texas
Pacific Airmotive Co., Glendale, California
Skymotive, Park Ridge, Illinois
Dayton Airadio, Inc., Vandalia, Ohio
Aeronautical Radio Manufacturing Co., Mineola, Long Island, N.Y.
Miami Aeromarine, Miami, Florida
Roscoe Turner Aeronautical Corp., Indianapolis, Indiana
National Electronics Laboratories, Inc., Alexandria, Virginia
Commercial Electronics Co., Minneapolis, Minnesota
Pionrad International Ltd., New York, N.Y. (Foreign except Canada)

A·R·C Aircraft Radio Corporation
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courses for A. & E. licenses. Leon Sturdivant, formerly with Braniff Airways and Dallas Aviation School, is director. . . . Recent customer at SAC was Jimmie Lunceford, the famous Negro orchestra leader, piloting his own Cessna UC-78.

Standard Parts & Equipment Corp., 904 North Main St., Fort Worth, has greatly expanded its operations with allocation of Globe Aircraft War Assets stocks valued at $5,000,000 supplementing an existing $2,000,000 inventory. Roy Browning is president; Guy Murray, assistant manager; Allyn Berry, secretary-treasurer. The firm is adding commercial lines to their War Assets parts, supplies and accessories.

A new repair station at Camden, N. J., is in operation by Spartan Aero Repair Division of Tulsa. The organization occupies two hangars at Camden's Central Airport and is staffed by veterans of Spartan's Tulsa Aero Repair, among them Paul Wilmes, radio laboratory, Herbert Stone, instrument laboratory, Tom Hudson, propeller shop, and William H. Hudson, engine overhaul.

A ground officer training program will be inaugurated by Parks College, East St. Louis, Ill., during September. A staff of regular Air Force officers and non-coms will activate ROTC units to qualify Parks students who volunteer for the purpose for regular or reserve commissions as second lieutenants in the Air Force. The program is divided into elementary and advanced training; the latter consists of specialized work in any one of eight different branches: meteorology, maintenance engineering, statistical control, armament, transportation, supply, communications and administration.

Southwest Airmotive Company, Dallas, has arranged with Beech Aircraft Corporation whereby, through cooperation with Dallas Aircraft Sales, Beech distributors at Love Field, **SAC becomes the official repair and overhaul base for Beechcraft** in the Northern Texas and Louisiana territory. Distributorship for B. F. Goodrich products in Texas, New Mexico, Oklahoma, Arkansas, Louisiana and Mississippi is also announced by Southwest Airmotive. The complete Goodrich line of products and equipment is included in the arrangement, which was worked out during a recent visit to Dallas of James S. Pedler, sales manager of Goodrich's Aeronautical Division and E. E. Bost, Goodrich company representative in the Dallas area. This brings to approximately 50 the number of parts and accessory manufacturers represented by the Sales Division of SAC.

Tommy King and Joe Cragin of Dallas have purchased Jacobs Aviation Co., at Highland Park Airport, Dallas, from Morris Jacobs and are operating GI flight training, maintenance and storage under the name of Glen Lakes Aviation Co. Cragin was formerly with Braniff Airways in line maintenance and both he and King were in the Army during the war. Jacobs has not decided future plans.

Maintenance and overhaul service for corporation-owned executive type aircraft is being handled by **Lockheed Aircraft Service, Inc., based at MacArthur Airport, Sayville, L. I.**, where W. R. Rhoads is base manager.

PERSONALLY SPEAKING—

LEE N. BRUTUS is new Pacific coast sales representative for Nylok Nut Corp., manufacturers of self-locking fasteners. He was at one time executive vice president of Waco Aircraft Corp., for 14 years and president of Luscombe Airplane Corp., at Trenton, N. J. . . . WALLACE O. LEONARD has been appointed assistant to the president of Pacific Airmotive at Burbank. . . . LOUIS R. KOEPNICK has been promoted to be chief engineer of Trans World Airline, assuming duties formerly assigned to J. C. FRANKLIN, who resigned to go with the Atomic Energy Commission. . . . FRANK SUNDERLAND has resigned as advertising and sales promotion manager of Edo Aircraft Corp.

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1027300 & 1027307 Series
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111904 Ser., all dash Nos.

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SK1292-1, 1118876, etc.

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WHAT'S NEW

An aircraft radio manufacturing firm, National Aeronautical Corp., has been established at Wings Field, Ambler, Pa., by James Riddle, president, and Rudy Garfield and A. Rufus Applegarth, vice presidents, all prominent in the industry. Initial production will involve several auxiliary radio attachments, including a lightweight VHF unit which can be incorporated in standard lightplane transmitters. Narco is actually two years old but in the past specialized in lightplane radio engineering and sales, assisting Hallicrafters Company in perfecting its popular Skyphone transceiver.

Newly-approved Aeromatic propellers include the F-200 for the Stinson 165 and Piper Super Cruiser on floats, 220 for 175-hp. Ranger Fairchild 24 and Grumman C-44A Widgeon. Aeromatic authorized service stations include Aircraft Sales Co., Meacham Field, Fort Worth; Aviation Propeller Service, Sky Harbor, Northbrook, Ill.; A. W. Whitaker, Portland, Ore.; Faulkner Aviation, Long Beach (Calif.) Municipal Airport; Parks Aircraft Sales, East St. Louis, Ill., and Palo Alto Airport, Inc., Palo Alto, Calif.

A manual with information required for air transport operations in the North Atlantic Region has been issued by the International Civil Aviation Organization, Montreal, Canada, and contains lists of navigational, communications, search and rescue and weather facilities available to aircraft, characteristics of land and water airdromes, examples of instrument approach and landing charts.

Goodyear Aircraft Corp. has developed a special new **spray device for spreading DDT from light aircraft.** It consists of a 42-gal. tank, an engine driven pressure pump and two 5-ft. spray tubes mounted under the wings. It is said to blanket an 80-ft. swath through forty .028-in. holes in each of the two tubes, one 42-gal. tank covering 42 acres with a concentration of .3 of a pound of DDT per acre.

Plya-Seal bearings are described in a new catalog available from Fafnir Bearing Co., New Britain, Conn., as being the logical successors of metal-shielded and felt-sealed aircraft control bearings. The new seal is a flexible washer of plastic-impregnated fabric, non-capillary and impervious to liquids, grease, oil, gasoline, steam and solvents.

A new 4-lb. model dry chemical fire extinguisher, 19⅛ in. long and 3½ in. in diameter, has been announced by Ansul Chemical Co., Marinette, Wis. The dry chemical is said to be non-toxic, non-corrosive, non-abrasive and non-conductor of electricity. The device can be refilled on the spot after use.

Wheel pants with landing lights are being marketed by Aviation Accessories Corp., Fort Worth. The lights have Plexiglas lenses to protect them. Each is adjusted to illuminate the ground at 400 ft. in front of the plane in level flight at an altitude of 15 ft. prior to landing stall.

Walter Kidde & Company, Belleville, N. J., has announced a **new lightweight trailer carrying 300 lbs. of carbon dioxide** for fighting fires on ramps, runways and around airports.

Gauging devices for safely inflating, deflating and gauging pressure of landing gear cylinders and accumulators are available from A. Schrader's Son, Brooklyn, N. Y. Refined from AAF types, they have a range from 0 to 1,500 lbs. psi.

New Literature: Cee-Bee cold cleaner for decarbonizing, degreasing and bright-cleaning engine parts, from Cee-Bee Chemical Co., Inc., 655 E. Gage Ave., Los Angeles 1; Underwing Fueling, from Parker Appliance Co., 17325 Euclid Ave., Cleveland 12; Merchandise catalog and price lists, free to dealers using letterhead, from Pan-American Navigation Service, 12021 Ventura Blvd., North Hollywood, Calif.; gravity conveyor catalog, from Rapids-Standard Co., Grand Rapids, Mich.

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D-558 Sets 650.6 MPH. As New Speed Record

The Navy's experimental supersonic laboratory aircraft, D-558 Skystreak, by Douglas, powered by a TG-180 jet engine, last month exceeded the Army's newly-set P-80R speed record of 623.8 mph. by averaging 640.7 mph. on August 20 and 650.6 mph. on August 25. All three world's record flights were averaged from four runs each over a 3-kilometer (1.863 miles) course at Muroc Army Air Base, Calif., and at altitudes of only 25 to 75 feet above the sand. Commander Turner Caldwell, who made the August 20 record, chalked up the highest run yet attained, 653.4 mph. on one of his four passes.

CAA Designates First Skyway for Lightplanes

Survey flights were to begin early in September to lay out and airmark the first transcontinental skyway from Los Angeles to Washington for private fliers, which has been designated officially for CAA marking.

CAA Administrator T. P. Wright said designation of the route officially provides for airmarking, with local co-operation, of towns within a 20-mile-wide area on each side of the route, the markers to consist of the town's name, degrees and minutes of latitude and longitude separated by a north arrow, airport direction symbol with distance, and an insignia consisting of a pair of wings with the skyway's "1" in the center. About 5,000 towns are on the route.

Skyway One courses Eastward from Los Angeles through Phoenix, Tucson, Douglas, Columbus and Wink to Abilene, Texas, where its North branch extends through Oklahoma City, Springfield, St. Louis, Indianapolis, and Pittsburgh to Washington, while its South route extends Eastward from Abilene through Dallas, Shreveport, Monroe, Jackson, Montgomery, Atlanta, Greenville, High Point and Richmond to Washington.

The Los Angeles Chamber of Commerce and Washington Board of Trade sponsored the route and its CAA designation and will campaign for local co-operation in airmarking it.

85-hp and 4-Place Taylorcrafts Planned

A new plane, designated Taylorcraft Model 47, is being produced by the new Taylorcraft organization, headed by C. G. Taylor and owned completely by Taylorcraft distributors and dealers. A two-place, side-by-side, all purpose plane, Model 47 differs from previous Taylorcrafts in that it has two doors, dual wheel controls, 18-gallon gas capacity and other modifications. The Taylorcraft distribution and service system is being expanded by the company's new vice president in charge of sales, O. F. Nesmith, who announces a stepped-up production schedule. Plans are under way for an 85-hp. job to go into production shortly, and a four-passenger model is contemplated for 1948.

NASAO Convention in Ft. Worth, Oct. 26-28

The annual convention of the National Association of State Aviation Officials will be held this year in Fort Worth, Texas, October 26-28. Forty-two state aeronautics commissions or other aviation agencies are now members of the Association. The nominating committee which will present candidates for the 1948 officers is headed by Dexter C. Martin, Director of Aeronautics in South Carolina. Recommendation for nominations will be open for submission to the committee until September 26. The Association has no full-time paid employes and depends entirely upon the activity of its members for representation in the various problems facing state officials in co-ordinating aeronautical matters with federal regulations and officials. Previous conventions have been marked by spirited debate and outspoken resolutions and a lively session may be expected at Fort Worth.

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Flight Planning Cut from Airman's Guide

To comply with budget restrictions and eliminate duplication with chart work already accomplished by the Coast and Geodetic Survey, CAA is eliminating all flight planning charts from the Airman's Guide, effective with the issue of August 19. Charts in looseleaf form, with current information as to radio facilities, may be ordered direct from the Coast and Geodetic Survey. The Airman's Guide will be reduced in size from 192 to 42 pages by the further elimination of airport directory information, which from now on will be included in the Flight Information Manuals, issued semi-annually. The next edition of the Manual will appear January 1, 1948. Present subscribers to the Airman's Guide are being urged to save the August 5 issue, which contains the most up-to-date airport directory available until the Manual appears.

All-Dixie Air Show

By EDITH WIDEMAN

The Flying Discs were not a myth but the real McCoy at Chattanooga's All-Dixie Air Show. We saw them, caught them upon their descent to earth, and even read them.

They heralded the participation of no less than 595 airplanes.

The eighteen acts went off like clockwork. It was the best show in our memory; we have never seen one that went off, from the first act until the jet-job closed the deal, according to program. This one did.

George Fulgum's seaplane landing on the grass opened the show. Nobody stole the show and nobody tried, but the crowd was impressed with the Army fighter formation and the Navy Corsairs coming across the field—wing to wing. The real thrill of the day was the delayed jump of Jack Huber, who fell from an altitude of 11,000 feet before opening his parachute at 900 feet. Kaddy Landry delighted the crowd with her stunts and Betty Skelton was the brave little miss who flies big airplanes with gorgeous smoke-batics. Jean Broadhead is still funny with her collapsible Cub, but not quite as funny as Bugs Thompson in his old pusher. Local color was added by Ches Hogshead, who aerobaticked all over the place.

TPFA Re-elects LeSage

Robert S. LeSage of Dallas was re-elected president of Texas Private Fliers Association last month at its annual meeting in Corpus Christi, with entertainment dominating the program. Others elected are: L. L. Woodman, Corpus Christi, first vice president; Mary Ann Hobbs, San Antonio, second vice president; Vida Foster, Bandera, secretary; Mrs. Robert Ragsdale, Austin, treasurer, and Governors C. E. Betts, Corpus Christi; Jimmie Kolp, Electra; Elmo Penn, Kilgore; Conrad Dunagan, Midland; J. O. Womack, Dallas; J. F. Crawford, San Angelo; Bobbie Taylor, Fort Worth; E. J. Reeves, Dallas; Mike Hegedorn, Houston; and Mildred Miller, Austin.

INDUSTRY BRIEFS

Repeat orders for Connies have been received by the Lockheed Aircraft Corporation from Pan American (4), Trans World Airline (4), KLM Royal Dutch Airlines (2), Panair do Brasil (1) and Irish Air Lines (2). **Lockheed has delivered 94 Constellations** since the first of the model went to TWA in 1945. Largest user of the Wright-powered, 328 mile-per-hour super transport is Pan American with 24.

Alfred Marchev, formerly president and chairman of the board of Republic Aviation Corporation, has been elected to the Board of Directors of Aircraft Screw Products Company, Long Island City.

Spare Parts for the new F-24 Fairchild and all other models of Fairchild planes henceforth will be available from the Fairchild Personal Planes Division at Strother Field, Winfield, Kansas, following removal of all tools and jigs last month to the new location.

CAA approval of the Martin 2-O-2 twin-engine, 40-passenger airliner was received on August 13. Northwest Airlines received its first three Martins in August with seven September deliveries scheduled. Linea Aerea Nacional of Chile is the second airline with 2-O-2's on order.

Military contracts announced last month include a $1,000,000 AAF order to Aircooled Motors, Inc., manufacturers of the Franklin engine, for 245-horsepower engines and spares to be installed in the Consolidated Vultee L-13's; a $7,500,000 AAF contract to Lockheed for modernization of 508 P-80A jet propelled Shooting Stars; a

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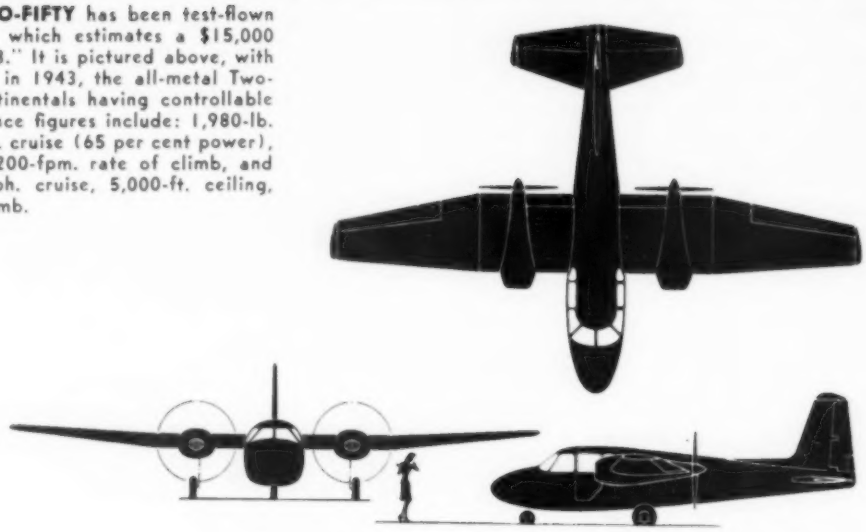
FIVE-PLACE, TWIN-ENGINE BRIGADIER TWO-FIFTY has been test-flown by Baumann Aircraft Co., Van Nuys, Calif., which estimates a $15,000 selling price for production "sometime in 1948." It is pictured above, with drawings at right showing plan views. Begun in 1943, the all-metal Two-Fifty is powered by two pusher 125-hp. Continentals having controllable props. Company specifications and performance figures include: 1,980-lb. empty weight, 3,200-lb. gross weight, 150-mph. cruise (65 per cent power), 57-mph. landing speed, 18,000-ft. ceiling, 1,200-fpm. rate of climb, and following single-engine performance: 100-mph. cruise, 5,000-ft. ceiling, 300-fpm. rate of climb.



$200,000 AAF order to Ryan Aeronautical Company for exhaust manifold systems, aircraft heating systems, collector rings for helicopters and various components for jet engines.

What's-New Department: First flight of Republic Aviation's No. 2 4-engine photo reconnaisance plane, the XF-12, was made on August 12. Designed by Alexander Kartveli, the 400-mph. mid-wing will be delivered to the Air Materiel Command. Preliminary tests are proceeding satisfactorily on a new Bell helicopter, the XR-12, designed for the Army Air Forces. Operating at 90 mph., the helicopter has a top speed of 105, a service ceiling of 13,000 feet and range of 300 miles. Pratt & Whitney powered, it has a normal gross weight of 5,803 pounds and carries a useful load of 1,630 lbs. Minneapolis-Honeywell has started delivery on a $2,000,000 order for a new type of improved autopilot for installations on the B-50 and B-36 heavy bombers. Known as the E-6, the new electronic control system boasts economy in size and weight, new push-button operation and automatic engaging and automatic recovery features, which insure safe flight in case the pilot is temporarily incapacitated by smoke, by a bird crashing through the windshield or similar emergencies. It includes a "ride control" adjustment to permit selection of accurate straight and level flight for bombing.

Airfolk: DR. GEORGE W. LEWIS, director of aeronautical research for the National Advisory Committee for Aeronautics, has been appointed research consultant to the NACA, being succeeded as Director by Dr. Hugh L. Dryden of the National Bureau of Standards. . . . EDWIN A. LINK, internationally known for his Link Trainer and other flight and navigational "ground" trainers, has been awarded the Wakefield Gold Medal by the Royal Aeronautical Society of London for contributions to safety in flying. . . . JOHN K. NORTHROP, president of Northrop Aircraft, Inc., has been awarded the Spirit of St. Louis Medal of the American Society of Mechanical Engineers, for his development of the Northrop Flying Wing. . . . JOHN E. CANADAY, director of public relations of Lockheed Aircraft Corporation, has been elected chairman of the Western Region Public Relations Advisory Committee of the Aircraft Industries Association, succeeding DALE ARMSTRONG, who has left Northrop to join TWA. BURDETTE S. WRIGHT is chairman of the Eastern Public Relations Advisory Committee. . . . New officers of the Independent Airfreight Association elected at a meeting of trustees in Washington last month are EARL F. SLICK, president; ROBERT W. PRESCOTT, HARRY R. PLAYFORD, C. F. WILLIS and J. J. O'BRIEN, vice presidents; COL. L. H. BRITTIN, executive director and treasurer and H. STRUVE HENSEL, general counsel. Offices of the Association are at 435 Woodward Building, Washington, D. C.

Short Snorts: Piedmont Aviation, Inc., Winston-Salem, North Carolina feeder line operator, has become the 34th scheduled airline to become a

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member of the Air Transport Association. . . . The Boeing Aircraft Company sponsored a three-day high altitude symposium last month to disseminate and exchange information and experience on the design and operation of high-altitude, pressurized aircraft. . . . Among important anniversaries observed last month were the first anniversary of the Santa Fe Skyway, Inc., air freight operations and the 20th birthday of air express, which was established in 1927 by the domestic airlines and the Railway Express Agency. . . . Last of the new DC-4's was delivered by the Douglas Aircraft Company in August to South African Airways. Concluding a five-year manufacturing program which produced 1,163 military and 79 post-war commercial transports of the DC-4 type, the Douglas company believes there are now more than 1,000 still in use and that many will be flying ten years from now. . . . The international closed-course speed record for 10,000 kilometers was broken by the AAF on its 40th anniversary by the Pacusan Dreamboat Boeing B-29, which flew a 2,500-kilometer course between Patterson Field (Dayton) Ohio and Benson, Arizona, four times in 22 hours and 27 minutes. . . . Hamilton Standard Propellers has completed final tests of a new type of control system for reversing Hydromatic propellers, which permits the pilot to push his throttles forward to move the airplane forward and pull them back for reverse action. A detent mechanism between the two quadrants enables the pilot to shift from positive to reverse thrust as though shifting gears in a conventional automobile. . . . Reduction in expenses and greater passenger loads were the principal reasons for a net profit of $201,690 for Trans World Airline during the three months ending June 30. . . . American Airlines has received delivery on 29 of the 50 four-engine DC-6's on order from the Douglas Aircraft Company. American's present inventory includes, in addition to the 6's, 39 DC-4's, six DC-4 Airfreighters, 62 DC-3's and five DC-3 Airfreighters. Also on order are 100 Convair 240's.

Lockheed Aircraft Service, Inc., is converting five A-26 bombers into 300 mph. executive transports at its Burbank, Calif., base. Four of the airplanes are for Superior Oil Co., and the fifth is for the Stanolind Oil and Gas Co.

Operators Impressed by Cross-wind Gear in CAA Demonstrations

GROWING acceptance of the cross-wind landing gear idea by airport and aircraft sales operators interviewed by SOUTHERN FLIGHT, which toured several airports in a CAA L-4 Cub using the Goodyear castered gear, coincided last month with announcement of Firestone's new Super-Flex cross-wind landing gear developed on an Ercoupe, the first such gear for a nose-wheel airplane.

Firestone's new gear for nose-wheel airplanes incorporates a rubber torsional, conical disc assembly with a patented Super-Flex rubber spring allowing the wheel to caster. All of the rubber equipment is installed on the landing gear strut; the wheel remains standard. Weight of the new device adds only 1½ lbs. to the conventional gear.

In the SF-CAA tour, Bill Berry, Fourth Region Assistant CAA Administrator for Private Flying, and an SF editor took the Goodyear-equipped Piper L-4 to several Dallas airports where operators were asked to try the gear and then comment on its operation and possibilities. Most of them were skeptical even after watching it perform but agreed, with smiles, that "it really works" after personally taxiing, taking-off and landing a few times with it. Cross-winds at the time were not strong, being just enough to affect the gear. Here are typical comments:

Skyline Airport: F. C. Nagle, co-owner of airport, aircraft sales and service operator and long-time mechanic, instructor, and test-pilot admitted "it's better than I thought." He added: "It will make more one-

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strip airparks possible and it is very simple, requiring much less skill for students than stiff-legged airplanes. However, it appears to require more technique for taxiing. It just happens that my airport, which has only one runway, wouldn't benefit from the cross-wind gear. We're located in a sink, behind a rise in the ground which protects us. In three years we haven't lost a dozen days due to cross-winds. So the gear wouldn't appeal to us here on that score."

White Rock Airport: Jack Parker, Parker-Huett Aviation Co., aircraft sales and flight school operator said, "Besides making one-strip airports more practical, the cross-wind gear allows tail-wheel airplanes to be S-ed while taxiing in a straight path. This will greatly help students and keep them from running off the taxi strips into mud and other airplanes." Bob Bullock of Masters & Bullock Aviation Service, flight school: "That gear is remarkable. I believe it will prove a big help to students. It seems to be foolproof."

Highland Park Airpark: Clyde Barrow of Hicks Aviation Service, Ercoupe distributors, said, "The gear really gives stability on take-off and landing. A student can mishandle the rudder and still keep a straight track. Castered gear on Ercoupes will give conventional pilots more confidence in the Ercoupe. On the Cub, the gear requires more rudder for taxiing. But students use more rudder than they need anyhow. So maybe it's just the thing for them." Julius Hudson, operator of Highland Park and an instructor, said the cross-wind gear is "definitely an improvement in lightplane landing gear." He added: "If they standardize it on airplanes, people will go for it. I tried to groundloop the Cub at 25 mph. on landing, giving it full rudder, but it just made a big circle and the wing didn't even go down. I believe I'd buy a set of those wheels if the price was right." Henry Stewart, flight school operator, said he believes the gear is more practical than it appears to be. However, he believes it requires more technique for taxiing than stiff-legged trainers. He would rather its use became more universal before buying it.

Mustang Airport: J. O. (Toots) Womack, airport operator and Cessna distributor, still believes the Cessna spring-steel gear can take higher cross-winds than the swivel gear, declaring his Cessnas operate in 40-mph. cross-winds. After flying the Cub, he said, "Larger airplanes, such as transports, will benefit more from castered gear than lightplanes."

Bill Berry, who was demonstrating the CAA Cub by allowing operators to fly it, said he found it foolproof in several hundred cross-wind landings, take-offs and in taxiing. Highest cross-wind he experienced was 25 mph. at 90 degrees. "It certainly is simple," he said. "I don't see how anybody, including students, could go wrong with it. Taxiing appears to be difficult but after a pilot gets the hang of using rudder and power it becomes simple. I have put the Cub into some tight places while taxiing and parking without difficulty. The cross-wind gear's major benefit, I believe, will be in making one-strip airparks practical. This will mean more strips close to business and residential districts, where property is both scarce and expensive. It will also mean more individuals such as ranchers can put in their own strips close to their residences."

Berry had demonstrated the gear at the National Flying Farmers convention at Stillwater, Oklahoma, and at the Texas Private Fliers Association convention at Corpus Christi. He said CAA inspectors had found the gear practical. The airplane was to be demonstrated in the Second CAA Region (Southeast) during September.

Goodyear has not announced pricing of the cross-wind gear. It is believed the firm will market it as a kit. The device is contained wholly inside the wheels and has no controls except conventional brakes. It permits 25 degrees of swivel to both left and right from center. Its weight is slightly more than conventional wheels with brakes. Although Goodyear has not stated a price, it is reported that the kit would sell for about $50 or $60 per airplane.

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STUDENT ERRORS

(Continued from page 12)

held to keep plane turning. (2) Holding wing up with aileron, resisting natural banking. (3) Counteracting imaginary slip in downwind turn.

Corrections: (1) Tell student, "Use rudder only to start the turn. Then relax and allow it to return to neutral. Always use aileron in same direction as you use rudder." (2) See "Decreasing Bank" above; in this case bank does not decrease because aileron pressure is compensated by excessive rudder. Emphasize that aileron is not to be used without using rudder in same direction. Explain that stability of plane makes it try to bank in proportion to rudder pressure. Demonstrate use of rudder to raise or lower wing. Repeat, "Relax on rudder." This will reveal improper use of outside aileron, as plane will roll out of turn when rudder is released. (3) Explain apparent slip is really drift and should not be fought. See "Holding Wing Up with Aileron" above.

LOSS OF ALTITUDE. *Mechanical Cause:* See "Slipping, Diving" above; also, lack of power. *Psychological Cause:* Failure to co-ordinate increase of power with increased bank or decreased radius of turn.

Correction: Explain that throttle is just as much a control as rudder and must be co-ordinated with others as more power is needed. As the angle of attack is increased by back pressure on stick to compensate loss of effective lift in turn, drag increases, resulting in loss of speed. Less speed means less lift, so more power is needed to maintain speed against the increased drag.

Rolling Turn to Turn

NOSE COMING UP BETWEEN TURNS. *Mechanical Cause:* Back pressure on stick. *Psychological Cause:* Forgetting to relax the pressure being held in turn.

Correction: Tell student, "You are holding the nose up in the turn. There is an instant between turns when the ship will be in level flight, so you must relax on the stick, just as in level flight. Then apply back pressure again as you go into the other turn."

SKIDDING. *Mechanical Causes:* See "Turns" above. Too much rudder on entry to turn; rudder too soon (ahead of aileron). *Psychological Cause:* Idea that turn is accomplished with rudder.

Correction: Always lead with aileron in starting a turn, and use rudder in proportion to prevent slipping. General rule to avoid dangerous skidding: Start a turn with the ailerons; stop a turn with the rudder.

SLIPPING. *Mechanical Causes:* See "Turns" above. Not enough rudder on entry to turn; rudder too late on entry. Not enough aileron on recovery; aileron too late. *Psychological Causes:* (1) Forgetting to use subordinate control. (2) Over-correction for skidding.

Corrections: (1) Use stick and rudder together in proper proportion. Don't neglect either one. (2) Never mind unless error persists; then correct as in "forgetting to use subordinate control," above. ★ ★ ★

JUST AMONG OURSELVES

(Continued from page 6)

passenger revenue. It is scientifically worked out so that the more traffic developed, the more money the airline makes but also the more money the government saves on mail pay.

With the Pioneer rate set at the 45-cent maximum, the rate will be payable when the line's monthly passenger load factor is 35 per cent or less and is to be computed on the basis of 21 passenger seats per plane. For each 1 per cent increase in the passenger load factor above 35 per cent, the rate for mail pay is to be decreased one-half cent. Thus, from a maximum rate of 45 cents at a 35 per cent passenger load factor the mail rate drops to 44.5 cents at 36 per cent; to 44 cents at 37 per cent load factor, and so on. Pioneer will realize a net increase in revenue of .445 cent for each 1 per cent increase in the passenger load factor.

Docket 2002 is a significant decision and the Board is to be congratulated for finally getting down to brass tacks.

This welcome news can be eclipsed only by new feeder airline transports in which aircraft manufacturers have invested millions of dollars, not one cent of which has been or needs to be subsidized. ★ ★ ★

FLYING THE 195

(Continued from page 11)

171 mph. block-to-block.

Our speed for both ways averaged 164 mph., block-to-block. We had flown a total of 377 miles in 2 hrs. 18 min.

The Cessna 195 should appeal to pilots and owners who like extra comfort with their speed, as with the Wasp-powered Stinsons, single-engine Beechcrafts and Howards, and the person who likes performance free from gadgets. If you have the gas turned on and trim tab set, throttle and propeller controls are all you have to play with. Flap position up or down would cause no real trouble. You can't forget to pull up the gear or let it down. If you feel inclined to fiddle with gadgets, there are available but not always necessary, mixture control, carburetor heat, cabin heat, pitot heat, landing light, radio, etc.

—Fred K. Dick, Pilot;
Tom Ashley, Observer.

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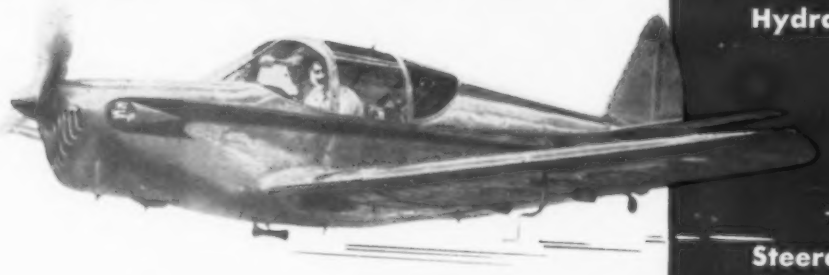

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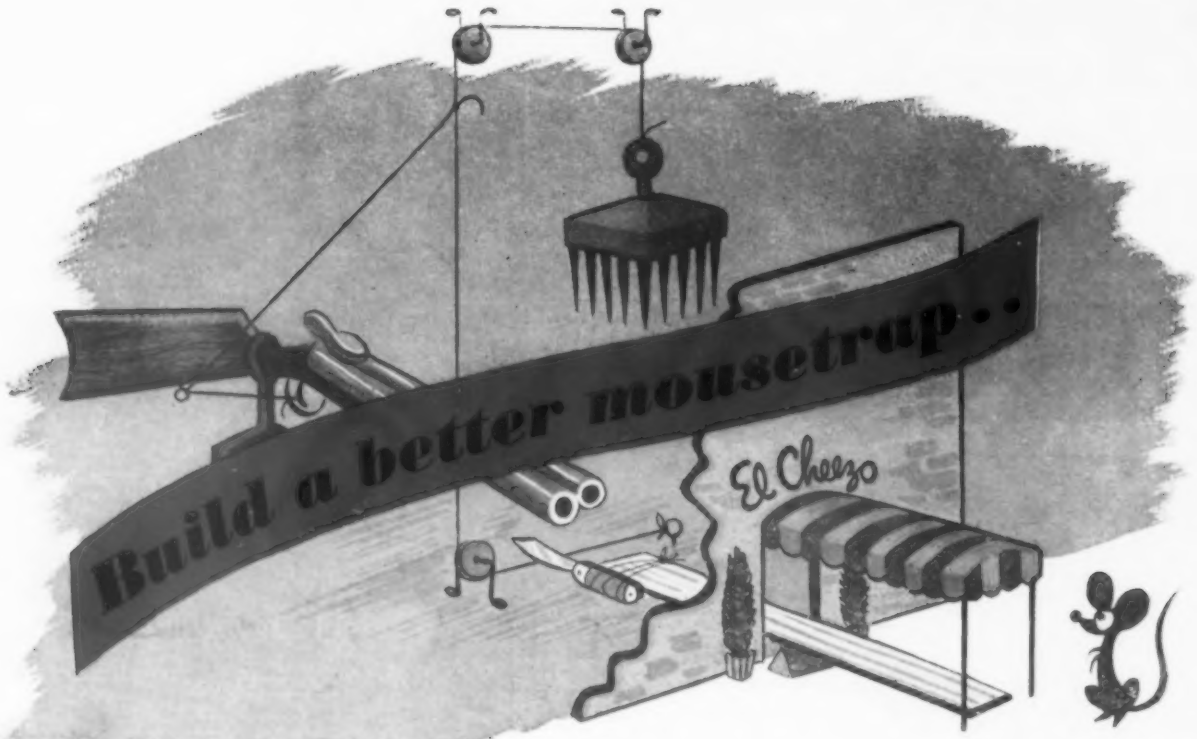

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